

# MSC 3 Research

Minimum-size  
dwellings & urban  
food

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# Minimum-size dwellings



# INTRODUCTION

## Compact apartments

In recent years Amsterdam has become increasingly popular. Due to a combination of a growing demand for housing and the hardly risen houses on offer during the crisis, housing prices have risen enormously as a result of the housing shortage.<sup>1</sup> The strong economic position of Amsterdam will also ensure a huge increase in the number of residents in the coming years. The city is also appreciated for its diversity, vibrancy and its many amenities.

In the coming years it is expected that housing prices will rise. When this development continues, Amsterdam will only be inhabited by a select (rich) group. The diversity will decrease and that does not benefit the city. Amsterdam is aware of this development and has presented plans for a completely new district for 70.000 dwellings.<sup>2</sup> Amsterdam North and the East of Amsterdam are also being developed further. In addition, densification of the existing urban landscape will be necessary.

These days 'the starter' especially has a hard time. Several newspapers have also paid attention to this problem. The small houses in this segment are also attractive for expats, investors and rich people. This further increases the price of the houses.

Moreover, for decades Dutch families have been getting smaller. In addition, the number of one and two-person households is expected to grow. The growth in the number of households in large cities is largely due to the growth

of these small households. This group is quite diverse: students, starters (one or two persons), expats, singles, single parents and the elderly (one or two persons).<sup>3</sup> Overall it can be said that the demand for small houses will increase further in the coming years.

The need for affordable housing in Amsterdam offers opportunities for innovative urban forms of housing that fit the lifestyle of a new generation, the new city dweller. All of this fits within the compact city while retaining its qualities. The price of the houses has to be lowered and with the high square meter prices, compact apartments can offer a solution. This goes beyond a normal studio dwelling. History has many examples of this on national and international level. For example, Japan has been very innovative in the field of 'compact' on many scales for years.<sup>4</sup> The growing group of one and two-person households belongs to the new city dweller. This target group attaches less value to private ownership and is willing to share more. After all, the more you share, the cheaper the living becomes.<sup>5</sup> This group uses the city as an extension of their house, a kind of second living room. The car is no longer a general need, while urban facilities are important. They appreciate mobility and flexibility.<sup>6</sup>

This research looks at various aspects of these compact apartments. For example, attention is paid to the possible

1 Rooijers, E. (2016). Woningtekort wordt komende jaren alleen maar nijpender.  
2 van Weezel, T. (2017). Amsterdam bouwt stadswijk zo groot als Haarlem in Westelijk Havengebied: 40 tot 70 duizend woningen.

3 Hoorn, M., Kotte, R. (2016). Smart small living. Klein maar fijn.  
4 Synchron, Shift Architecture & Urbanism. (2015) XS Deluxe: Het Micro-appartement.  
5 Architectuurcentrum Amsterdam. (n.d.). Ontwerplab min of meer: microwoningen.  
6 Synchron, Shift Architecture & Urbanism. (2015) XS Deluxe: Het Micro-appartement.

### Plasterk: huis gaat naar belegger in plaats van starter



Particuliere beleggers verdringen starters op de Amsterdamse huizenmarkt, zegt minister Ronald Plasterk van Binnenlandse Zaken. Dit leidt tot krapte en hogere huizenprijzen.

DOOR MICHEL COUSZY 14 OKTOBER 2017, 07:00  
Mensen die voor het eerst een huis willen kopen in Amsterdam vinden in dit landje vijf of zes beleggers. Beide groepen moeten relatief late en voor zover daar nog sprake van is - goede woonlagen, constant Plasterk.

Dit leidt tot verdringing, waarbij koopstarters uiteindelijk het onderspit doeken, schrijft Plasterk in antwoord op Kamervragen van de SP.

Newspaper attention (parool.nl)

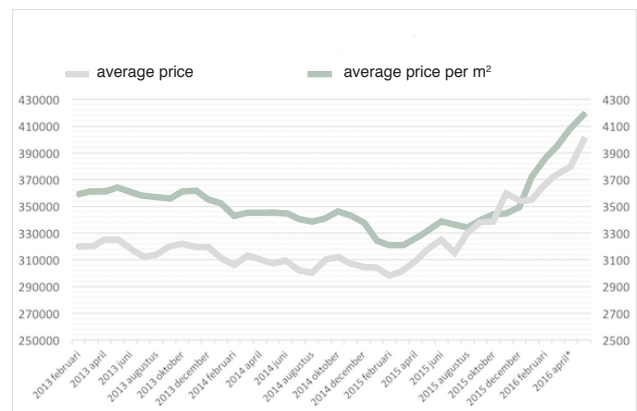
### Weer 'betaalbare' nieuwbouw in Noord aan neus van starters voorbij



Na Eisenhagen Noord en North O'Learys, lijkt weer een 'betaalbaar' nieuwbouwproject in Noord aan de neus van starters voorbij te gaan, omdat de gemeente geen goede afspraken heeft gemaakt met de projectontwikkelaar over de verkoopprijzen.

DOOR TOM KIEFF 13 APRIL 2017, 16:23  
Vrijdag begint de verkoop van de appartementen van het nieuwbouwproject 'Kade Noord' aan de Scherpenhoornweg in Noord.

Op de website van de gemeente staat dat in het complex, dat ten noorden van de NS300-weg wordt gebouwd, 37 duurzame, klimaatneutrale, betaalbare koopwoningen voor starters' bsmen.



Amsterdam housing market prices (daskapital.nl)

## INTRODUCTION

### Compact apartments

target groups and the level of collectivity that is important. In addition, we look at the current context in which different trends are present. We look as well at the history in the field of small innovative housing that are the foundation for the new compact apartment idea.

According to the Architecture center of Amsterdam, the definition of a compact apartment / micro-dwelling is a small home, but the location is as close as possible to the city center and often with shared facilities. It is a pragmatic solution that contributes to keeping urban life affordable.<sup>7</sup> By investigating these aspects and looking at current projects (case studies) inside and outside Amsterdam with a compact theme, we want to answer the question of what a compact apartment / micro-dwelling is and what architectural aspects are needed. Both for the dwelling itself and the entire complex. The term compact apartment is used in this document to limit the emphasis on a 'small home' and to see it more as an innovative solution.

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<sup>7</sup> Architectuurcentrum Amsterdam. (n.d.). Ontwerplab min of meer: microwoningen.

## CONTEXT

### Small smart apartments

The idea of smart small apartments is in line with various social trends that are currently going on. Various developments in society ask for a new way of living or create a new way of living.

#### Pressure

For decades Amsterdam is known of a severe housing shortage. At the moment the housing shortage reached its peaks with several consequences. Globally, urbanization is a trend. In the Netherlands people move towards the bigger cities as well. The prognosis for Amsterdam by the municipal research group OIS (Onderzoek, Informatie, Statistiek) is that the population of Amsterdam will grow towards 980.000 citizens by 2040. Currently Amsterdam has 848.630 inhabitants.<sup>8</sup> The urbanisation is partly caused by the fact that people identify themselves with the location and the type of dwelling where they live in. Due to this, more people want to live on the same location, the city of Amsterdam for this particular case. According to De Vries, the quality of the neighborhood, village or city became more important.<sup>9</sup> As a result of the popularity of the city, housing prices are rising what makes it for a lot of people harder to stay or move towards the city.

#### Changing households

Next to the housing shortage, last couple of decades the composition of households is changing as well. Dutch families are getting smaller and the amount of single and two person households is growing. The growth of cities is mostly caused by the exponential growth of smaller households. A small household can be formed by students, starters, expats, single parents and elderly. For a long time, living alone was a taboo in the Netherlands. Living alone was seen as a temporary situation, for instance in between two relationships. The individualization of the society did change this point of view. The acceptance for dwellings especially for the single target group is growing.<sup>10</sup>

#### Lifestyle

We also see a change in the urban lifestyle. Urban citizens use the city as their living room. Compared to the previous century, a big part of an urban life takes place in public spheres. This group is known as the 'nomadische stedeling' (nomadic townsman), according to Shift Architecture & Urbanism.<sup>11</sup>

This specific group prefers a good location above a big apartment. They chose to lower their ecologic footprint, sustainability is becoming part of the lifestyle. The upcoming sharing economy is part of this lifestyle. In 2014 half a million people took part in the sharing economy in the Netherlands. ING expected that same year 1 million users for 2015.<sup>12</sup> These numbers show the increasing interest in sharing, especially in the city. 'Owning less, sharing more' is an often heard statement recent years. More and more people question themselves whether they need to possess a product of that they can borrow or rent it from a friend, neighbor or company. Thanks to internet and smart phones it is easier to organize the sharing economy. The need of sharing implies also for amenities in peoples daily lives. It is getting more common to share amenities in building complexes, in order to save square meters in the apartments. Moreover, we need less space due to new technologies. We work at the dining table with our laptop, a desk is not necessary anymore. All our books are on a e-reader or tablet as well as music. This are just some examples. Hence the urban society becoming more flexible. Nowadays people work everywhere, at home, in the library or at the coffee shop on the corner.

8 CBS Statline (2017) Bevolkingsontwikkeling: regio per maand.

9 De Vries in Hoorn, M., Kotte, R. (2016) Smart Small Living: Klein maar fijn.

10 Hoorn, M., Kotte, R. (2016) Smart Small Living: Klein maar fijn.

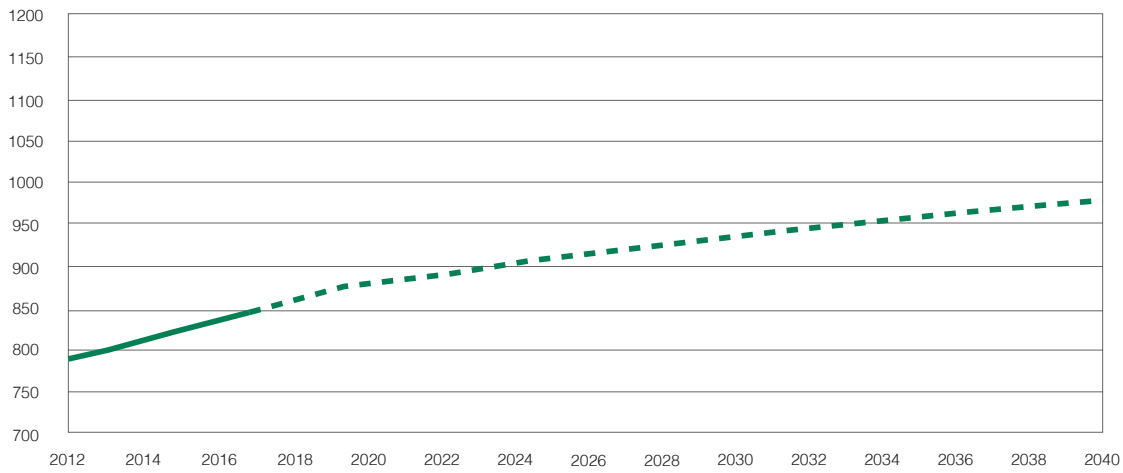
11 Synchroon, Shift Architecture & Urbanism. (2015) XS Deluxe: Het Micro-appartement.

12 Janssen, S., van Garderen, M., Hieminga, G. (2014) Ruim half miljoen huishoudens doen mee aan de deeleconomie.

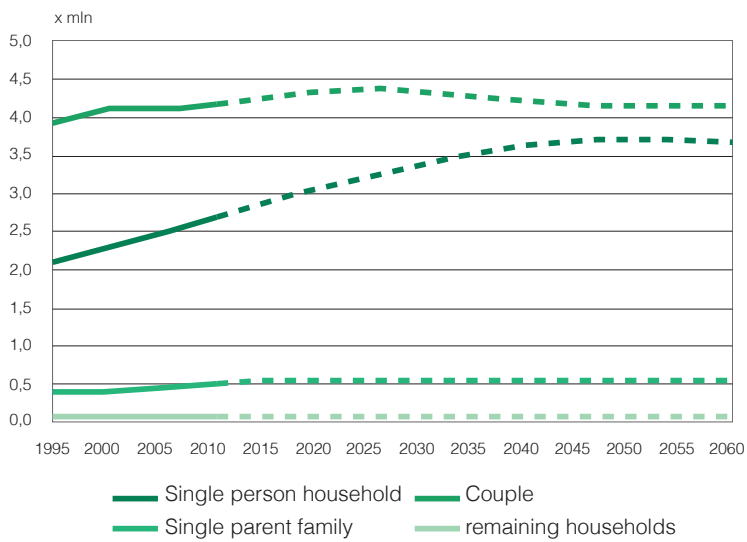


# CONTEXT

## Small smart apartments



Prognosis population growth Amsterdam (data from *statline.cbs.nl*)



Prognosis single person households (data from *statline.cbs.nl*)

# HISTORY

## Introduction

Although the idea of smart small apartments seems to be a development of recent years, the concept of compact living started in the beginning of previous century.

In the beginning of the 20th century functionalism was the start of the rational approach of the dwelling floor plan. The goal was to design comfortable houses for the society. Norms and regulations were made to achieve these goals. After the second world war the vision of functionalism played an important role in solving the housing shortage. Most new build houses were focused on the working class.<sup>13</sup>

During the 1960's the society individualized and the welfare grew. This resulted in a demand for variation in the way of living. Experiments with new ways of living like capsules or flexible furniture were popular. At the same time was the interest in hedonism growing. However, most of the experiments were realized on a small scale.

In the 90's the government became less involved in housing. A housing market arises and housing becomes more relate to a certain lifestyle. The urban life develops and there is a growing interest in new ways of housing, like the smart small apartment.<sup>14</sup>

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13 Synchron, Shift Architecture & Urbanism. (2015) XS Deluxe: Het Micro-appartement.

14 Synchron, Shift Architecture & Urbanism. (2015) XS Deluxe: Het Micro-appartement.

# HISTORY

Time line<sup>15</sup>

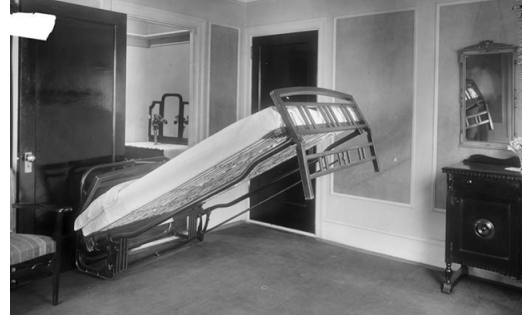
## Time line

### First patent Murphy-bed

*William L. Murphy*

A bed designed by William L. Murphy. The bed can fold up in order to save space in small apartments.

+/- 1900



### Justus van Effencomplex, Rotterdam

*Michiel Brinkman*

For that time this building block was striking. In the inner courtyard is a building where facilities like laundry, ironing and heating are centralized. This saved space in the dwellings.

1921-1992



### Het Nieuwe Huis, Amsterdam

*Barend van den Nieuwen Amstel*

This apartment complex was one of the first buildings especially for singles. The complex exists of more luxurious small and medium sized apartments. A concierge helped the inhabitants with daily chores like cleaning and shopping. On the ground floor are next to some shops a public library, a collective restaurant and a central kitchen.

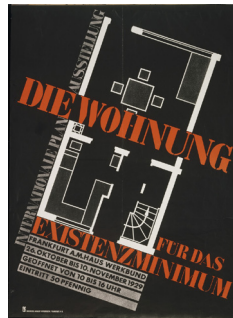
1927-1928



<sup>15</sup> Images and text retrieved from Synchron, Shift Architecture & Urbanism. (2015) XS Deluxe: Het Micro-appartement.

# HISTORY

Time line

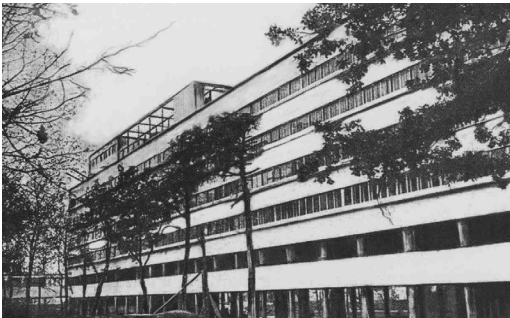


1929

## Existenzminimum

CIAM/Walter Gropius

At the end of the 1920's the modernists worked on Existenzminimum. Their goal was to develop an apartment with the basic needed facilities for mass production. By doing this, they searched for a solution for the high rent of the working middle class.

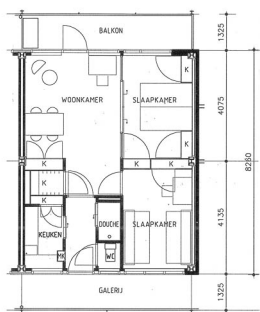


1928-1932

## Narkomfin building, Moskou

Moisei Ginzburg & Ignaty Milnis

A building complex build on socialist ideals. A lot of facilities were organized in a collective way. Facilities like kitchens, kindergarden, laundry, roof terrace, library and gym were collective functions. Some apartments were more depending on the collective facilities than others.



1932-1934

## Bergpolderflat, Rotterdam

W. van Tijen in collaboration with J. Brinkman & L. van de Vlugt.

The first flat with gallery access in the Netherlands. A revolutionary building because of the prefabricated design. Small apartments of 50 m<sup>2</sup> but because of a flexible setup and fold up beds still comfortable.

# HISTORY

Time line

1947-1952

## Unité d'habitation

*Le Corbusier*

Le Corbusier was inspired by the Narkomfin building in Moskou. There are four Unites d' habitation in Europe. This concept is also known because of its collective facilities. The collective functions are a kindergarten, daycare, gym, theater and a running track.

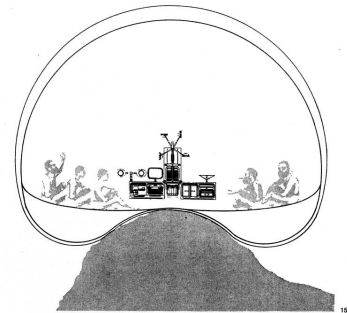


1965

## A Home is not a House

*Reyner Baham & Francois Dallegret*

An extreme concept by Ginzburg and Milnis to replace the traditional and permanent house by a minimal shelter with only the necessities for a modern life. This includes shelter, food, energy and television.



1966

## The Living Pod

*David Greene*

A Utopian plan developed by Greene with capsules for the 'nomadic townsman'. The capsules can be connected to a bigger structure or function independent in an open field.



# HISTORY

Time line



1970-1972

## **Nakagin Capsule Tower**

*Kisho Kurokawa*

This capsule tower is one of the most extreme examples of prefabricated apartment complexes. The tower was built for 140 single office workers. Prefabricated capsules of 10 m<sup>2</sup> are connected to a central core.



1971

## **Total Furnishing Unit**

*Joe Columbo*

Units with all the essential functions integrated that can be placed in a apartment.



1972

## **Expandable Living Container**

*Alberto Rosselli*

A lightweight house that can be expanded on four sides.



# HISTORY

Time line

1972

## Mobile and Flexible Environment Module

*Ettore Sottsass jr.*

A network of connectible modules with each an own function like stove, fridge, wardrobe, bathroom, jukebox and library. By using the modules it would be possible for everyone to create a personal living environment.

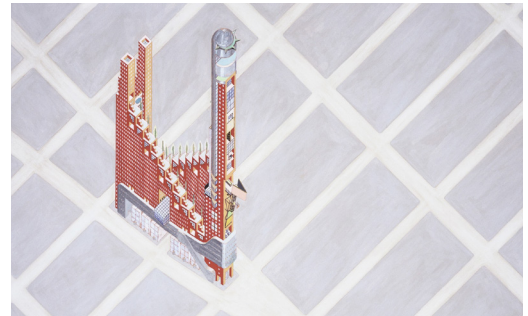


1975

## Hotel Sphinx, New York

*Elia & Zoe Zenghelis (OMA)*

A luxurious hotel as prototype for mass housing. Small apartments with luxurious balconies and high end collective functions.

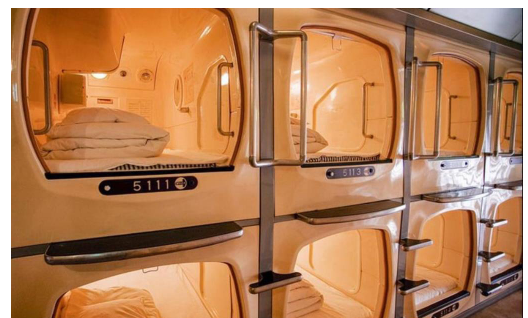


1979

## First Capsulehotel, Osaka

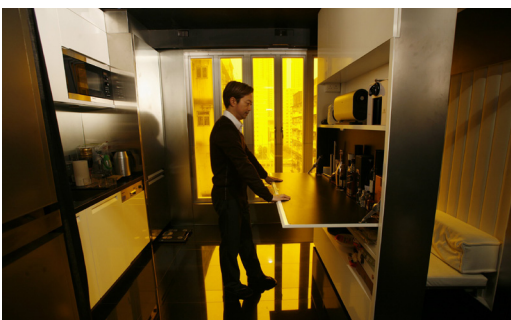
*Kisho Kurokawa*

Designed by the same architect as the Nakagin Capsule Tower. Each 'hotel room' is designed as small as possible and has a bed, electricity and a television.



# HISTORY

Time line



1990

## Kyosho Jutaku, Tokyo

The Kyosho Jutaku (micro dwellings) became popular in Tokyo during the nineties. The demand for smart small apartments was caused by high rent and a recession. The small single family homes were mostly built on very small plots, even on parking spots.

2002

## Microflat, London

*Piercy Conner*

Apartments of 32 m<sup>2</sup> with a prefabricated module that includes a kitchen and bathroom. Only a model apartment is realized.

2006

## 24-in-1 apartment, Hong Kong

*Gary Chang*

A Hong Kong based architect designed a 32 m<sup>2</sup> apartment for himself that could transform to 24 different spaces by sliding walls.



# HISTORY

Time line

## Sleepbox, Moskou

*Arch Group*

A unit with two separate beds that can be rented. It is placed on an airport and can be rented from 30 minutes to a couple of hours.

2011



## The Student Hotel, Rotterdam, Amsterdam, Den Haag

A hotel for international student. Students can rent a luxurious furnished room in a complex with collective functions like a kitchen, study room, library, game-room, restaurant and a gym.

2012



## Carmel Place, New York

*nARCHITECTS*

A complex with prefabricated units. The goal was to keep living in New York affordable by producing small and cost efficient apartments. In exchange for small, single-occupancy units, residents could share amenities-like a restaurant-kitchen, dining area, lounge, and cleaning services.

2013



# SUSTAINABILITY

## Sustainable densification

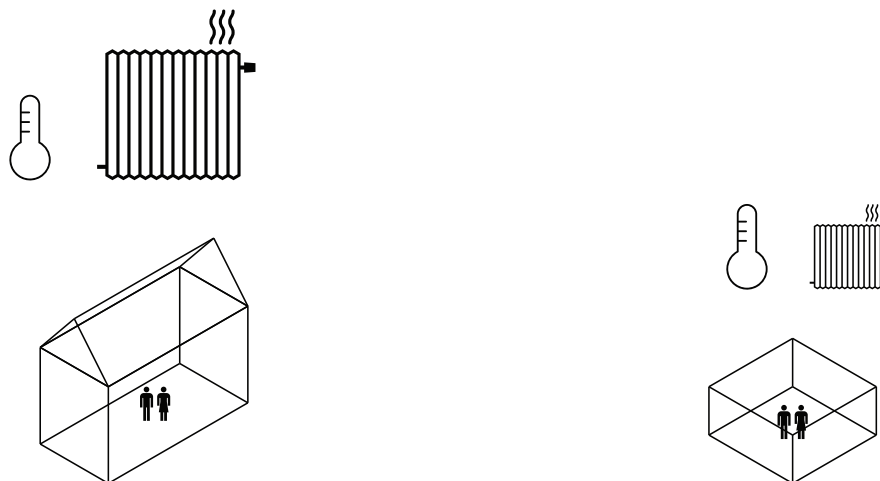
Living in a smart small apartment is sustainable in several ways. First of all is a smart small apartment complex a good way to densify the built environment. Obviously, compact apartments in a high density save on space, material and energy compared to low density housing.

High density complexes do have a lot of potential in creating a more collective way of living, what contributes to sustainability. This collectivity creates possibilities on sharing facilities and installations. A distinction can be made between 'need to have' and 'nice to have' facilities.<sup>16</sup> Especially 'nice to have' facilities are ideal to share with other inhabitants. But also facilities like washing machines and cars are great to share, especially because they are mostly not in use when owned by one or two persons.

Furthermore, a high urban density might reduce traffic because most facilities are within bike or walking distance. Smart small apartment complexes also contribute to social sustainability, since it stimulates diversity in the urban context.<sup>17</sup>

16 Hoorn, M., Kotte, R. (2016) Smart Small Living: Klein maar fijn.

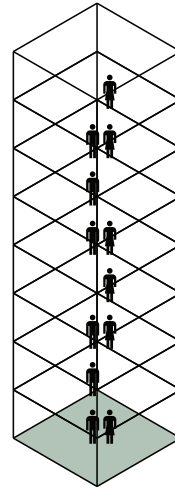
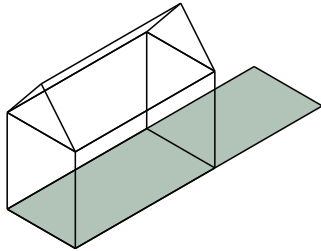
17 Synchron, Shift Architecture & Urbanism. (2015) XS Deluxe: Het Micro-appartement.



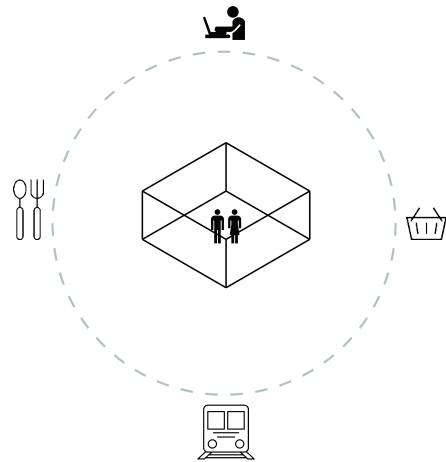
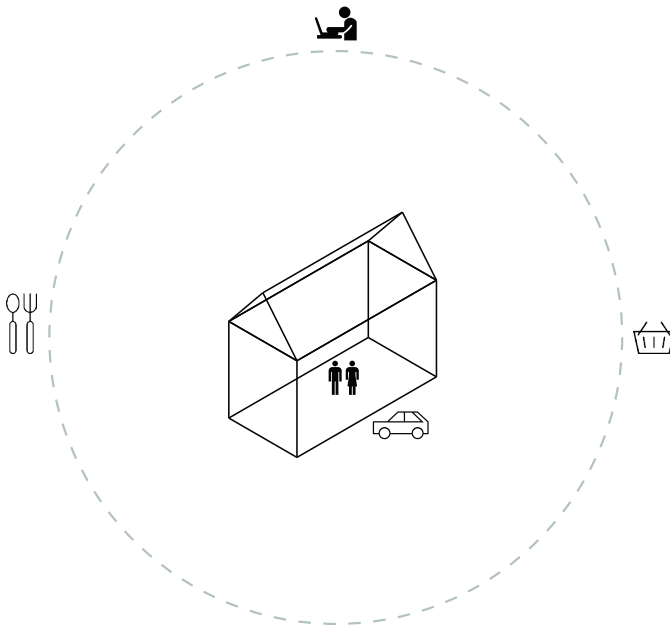
Heating less m<sup>3</sup> results in a more sustainable energy usage

# SUSTAINABILITY

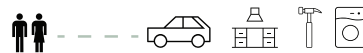
Sustainable densification



By stacking compact units space is used efficiently, it densifies the plot



Sustainable mobility because of close by facilities and public transport options



Sustainable lifestyle by sharing facilities and products

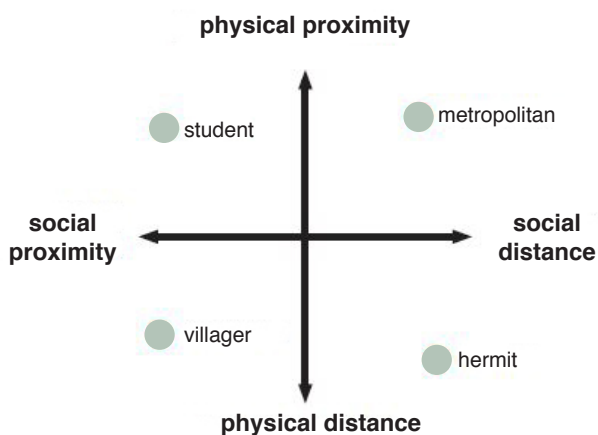
## TARGET GROUP

### Compact apartments

Due to the shortage on the housing market, many studio apartments have been built over the years. These often offered less housing quality for their price and did not exceed the level of a student house. Compact apartments can offer a much broader solution for various target groups. Existing studies on compact apartments often focus on obvious target groups such as the millennial generation or single people. This group also includes students, starters, people without children, people who are divorced and expats. However, due to a changing lifestyle and zeitgeist, these dwellings can also become attractive for other target groups such as elderly, status holders, people with shared interests, but also small families. Therefore, compact apartments can be interesting for target groups in different stages of life. According to the Architecture Center of Amsterdam (ARCAM) this diversity is desirable.<sup>18</sup>

#### Wide target group

ARCAM developed a sociological model called the 'Wekker-Duyvendak-diagram'. Instead of classifying in 'traditional' target groups such as starters, families and seniors, they thought about how an individual can relate to the collective, on multiple scales (apartment, building and neighbourhood).



Wekker-Duyvendak-diagram (Ontwerplab min of meer: microwoningen)

This chart provides guidance to identify the needs of potential residents. The compact dweller is a person who is in the diagram on the side of physical proximity. However, there are differences in the social proximity that a person wants to experience. The 'metropolitan inhabitant' who thinks the proximity of facilities and entertainment of the city is the most important, wants to live as individually as possible and share as few facilities as possible. The 'community seeker',

18 Architectuurcentrum Amsterdam. (n.d.). Ontwerplab min of meer: microwoningen.

on the other hand, wants to be part of a community, also at building level, and is willing to share more facilities. The compact dweller is a broad group in which the degree of sharing makes the difference. For example, older people want to share more anonymously. This means that it is shared among a larger group of people. In their case social proximity with only a few neighbours is not desirable.

According to ARCAM, compact dwellers will have to share facilities. They argue that small living spaces need high-quality public space and personal services. There is also a demand for a non-privatized roof terrace. Creating an 'address' is also important. By ensuring a beautiful entrance, the entire building shares the luxury of the address, no matter how large or small the house is. With these measures a 'leveled' building is created where the happiness of the residents is maximal. As compensation on the lesser surface, the quality of life of the house could be improved by higher ceilings, extra light and beautiful views.<sup>19</sup>

Sharing facilities also depends on the stage of life. Young people need the proximity of food service industry and flexible workplaces, while families place more emphasis on shared childcare, whereas elderly people need care. Sharing facilities can also be linked to a hobby or social life. A large kitchen to receive a group of friends or family is a need that many people do have, but can not always realize in their homes.<sup>20</sup>

Facilities like a laundry, gym, restaurant are just seen as a distinctive quality, which a resident is willing to pay for. For shared facilities we can make a distinction between facilities that a resident really needs because of his stage of life or lifestyle (need to have) and facilities that make the dwelling more attractive (nice to have). Like freelancers who come into contact with each other in the same building. Broadly speaking, we distinguish the target groups for compact apartments from 'the new city dweller', (single) elderly people and specific target groups (because of their hobby and way of life).<sup>21</sup>

19 Architectuurcentrum Amsterdam. (n.d.). Ontwerplab min of meer: microwoningen.

20 Hoorn, M., Kotte, R. (2016). Smart small living. Klein maar fijn.

21 Hoorn, M., Kotte, R. (2016). Smart small living. Klein maar fijn.

# TARGET GROUP

## Compact apartments

### Target group wishes

*Young adults: students, starters, singles and (starter) expats*<sup>22</sup>

The people in this target group have some similarities. They are mostly 1- or 2-person households, young and at the beginning of their careers. The young singles in particular provide a growth of the 1- and 2-person in the big cities. In terms of age, this group is very variable.

This difference of age also plays a role among the expats. The expat is looking for an independent accommodation in a central location. Not a (student) room, but an apartment with its own bathroom and kitchen. They see the city as an extension of the dwelling. Due to the lack of family and the social environment from their homeland, meeting places are important. The expat often chooses the bicycle and public transport over the use of a car.

Another group within the young adults are the students. Because of the difference in lifestyle, students are often not mixed with others within the target group of young adults. Nonetheless, they are often housed in the same building and use the same facilities. However, they live in different parts of the building. For student housing, the potential for compact apartments is linked to the cities where universities are located. After graduation, students can not continue to live in their student residence and have to look for a other living space.

*Families*<sup>23</sup>

Families as a target group for living in the city is on the rise. The parents of these families are often highly educated. They both work and have an above average income. Many of the families who value diversity in their living environment are pushed out of the city as a result of rising house prices or too small living places. This target group also sees the city more and more as an extension of their home. In the city, living, working, children and social life logistics can be combined more easily.

This target group has a good income. They are looking for a home that has similar qualities as a suburban dwelling. This does not have to be a house with a garden, but can also be a spacious outdoor area (15 m<sup>2</sup>) or a shared courtyard where children can play safely. Facilities such as childcare should also be nearby. The dwelling will possibly be smaller than a suburban family home.

There are a few non-ground floor dwelling with these qualities in the city. A housing typology as described should keep more families in the city. According to the Architecture Center of Amsterdam it is possible for small families to live in a compact apartment. In this case children must have their own bedroom and the master bedroom can be integrated in the living room.<sup>24</sup>

*Elderly*<sup>25</sup>

This target group is also interesting for compact apartments. Due to maintenance they often no longer want to live in a large house. Materialism is often also less important. Moreover, their needs change in social life. It becomes more attractive to live closer to friends and family. They also often live together or alone.

Today's 65-plus is in the midst of life and is enterprising. They are at the beginning of a new stage of life. They are looking for the comfort of smaller living near amenities and public transport. They want to move within the city or region to a place that meets these requirements.

The current trend is that older people have to stay at their own place longer and have to purchase care. By living close to each other and sharing facilities, care can be purchased in an efficient manner. Loneliness is also prevented because they can live with like-minded people.

### The new city dwelling

This research mainly focuses on the new city dweller. This target group:

- Prefer central living above a large land-based home.
- Want to live in proximity to amenities and work.
- Is less car-centric.
- Is willing to share facilities if this offers added value.
- Spends a lot of time outside the home.

Within the target group of the 'new city dweller' we can distinguish various subgroups each with their own needs. In this study single and couples get the attention. The compact apartments are also the most suitable for these smaller family compositions.<sup>26</sup>

22 Hoorn, M., Kotte, R. (2016). Smart small living. Klein maar fijn.

23 Hoorn, M., Kotte, R. (2016). Smart small living. Klein maar fijn.

24 Architectuurcentrum Amsterdam. (n.d.). Ontwerplab min of meer: microwoningen.




25 Hoorn, M., Kotte, R. (2016). Smart small living. Klein maar fijn.

26 Synchroon, Shift Architecture & Urbanism. (2015) XS Deluxe: Het Micro-appartement.

# TARGET GROUP

## Needs

Overview target group compact apartment <sup>27</sup>

	 <b>Starter</b>	 <b>Bachelor</b>	 <b>Couples</b>
<b>Budget</b>	● ●	● ● ●	● ● ●
<b>Need of luxury</b>	● ●	● ● ●	● ● ●
<b>Need social contact</b>	● ● ●	● ●	●
<b>Need of services</b> (doorman, house keeping, etc.)	●	● ●	● ● ●
<b>spatial need</b>	20 - 30 m <sup>2</sup>	20 - 40 m <sup>2</sup>	40 - 50 m <sup>2</sup>
<b>programmatic need</b>	collective space shared use roof terrace storage space	guest house cooking studio swimming pool / sauna roof terrace storage space	guest house cooking studio swimming pool / sauna roof terrace storage space

<sup>27</sup> Synchron, Shift Architecture & Urbanism. (2015) XS Deluxe: Het Micro-appartement.

## CASE STUDIES

### Introduction

For the research on smart small apartments 4 case studies are researched. The case studies exist of both built projects but also not (yet) realized projects. We were able to visit one of the projects, North Orleans in Amsterdam.

Each case study analysis begins with an overview of the project. A short description is given next to an info-graphic. The info-graphic shows the most important characteristics of the project in diagrams and numbers.

The complex is studied on the floor plan. The most useful information for us is the ratio of  $m^2$ , amenities and routing. Questions like "how much  $m^2$  is needed to access a certain amount of units?", "What kind of collective/public amenities are organized in the complex?" and "What is the routing through the building?" are answered. This is helpful information for the design of a smart small apartment complex.

The individual units are also mostly studied by the floor plan. Because of the small and efficient floor plans of compact apartments the ratio of  $m^2$  in the units is interesting. Next to that, the way of access in relation to the routing in the complex is useful information. To give insight in the cost efficiency the ratio of construction wall - facade is also studied.

The collection of data is comparable and forms a valuable set of information for the development of a new compact/smart small apartment complex.

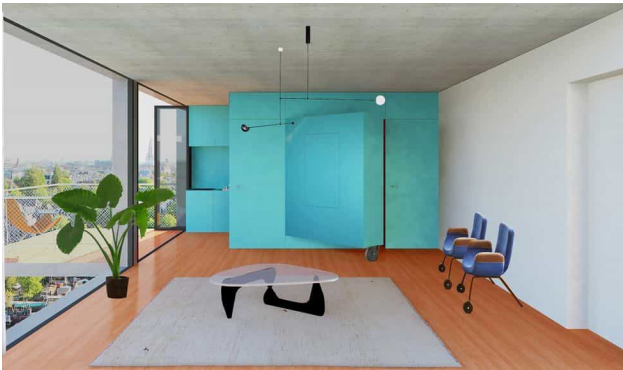


## CASE STUDIES

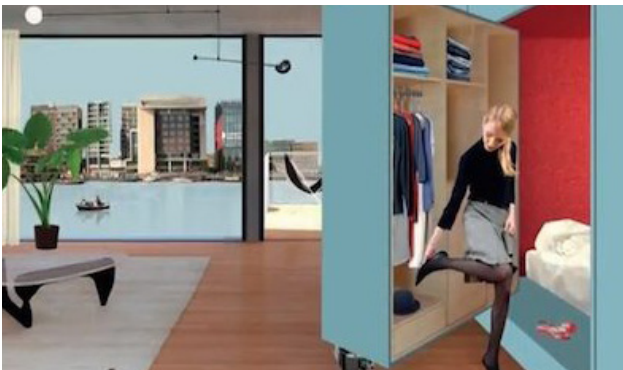
### XS Deluxe Houthavens, Amsterdam



XS Deluxe Houthavens courtyard (Shift-au.com)



XS Deluxe Houthavens interior (Xsdeluxeamsterdam.nl)



XS Deluxe Houthavens interior (Amsterdamwoont.nl)

XS Deluxe is a concept for a new way of living, developed by Synchron development and Shift Architecture & Urbanism. XS Deluxe is a concept for micro-apartments in the city. Due to high prices and a high demand cities like Amsterdam are becoming less accessible. Micro-apartments are comfortable to live in because of efficient use of space and shared amenities. Living smaller and sharing facilities fits in the sustainable and modern urban lifestyle.

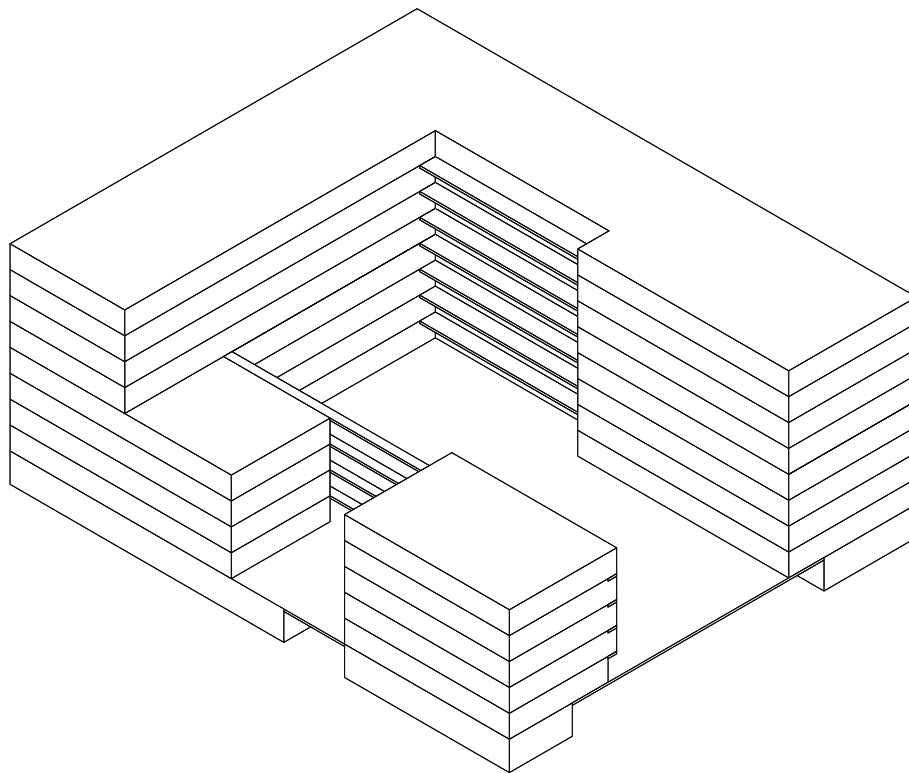
This specific design is made for the Houthavens in Amsterdam. The Houthavens is an upcoming neighborhood with a lot of new developments.

Synchron and Shift describe the target group for XS Deluxe as 'the new urbanist'. According to the developers students, starters, bachelors, expats and empty nesters fit in this target group. The new urbanist uses the city as their living room and asks for flexibility in their way of living and working. In this way of living sharing is the new property.



# CASE STUDIES

## Info-graphic



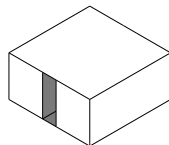
### Complex

### Units

#### Amenities



#### Access

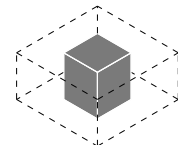


#### Dwellings

Dwellings Types 235  
4

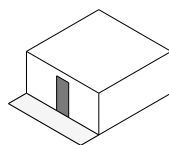
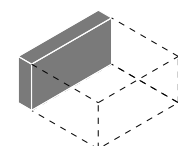
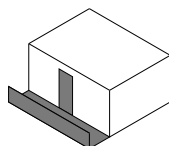
Standard widths 7400 mm  
6000 mm  
3700 mm

#### Unit types



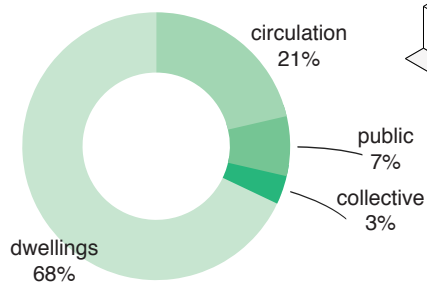
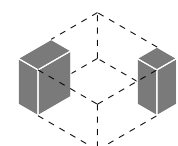
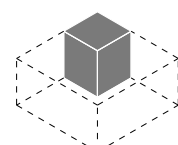
#### Square meters

Dwellings	11.024m <sup>2</sup>
Collective	560 m <sup>2</sup>
Public	1.170 m <sup>2</sup>
Circulation	3.470 m <sup>2</sup>



#### Solutions

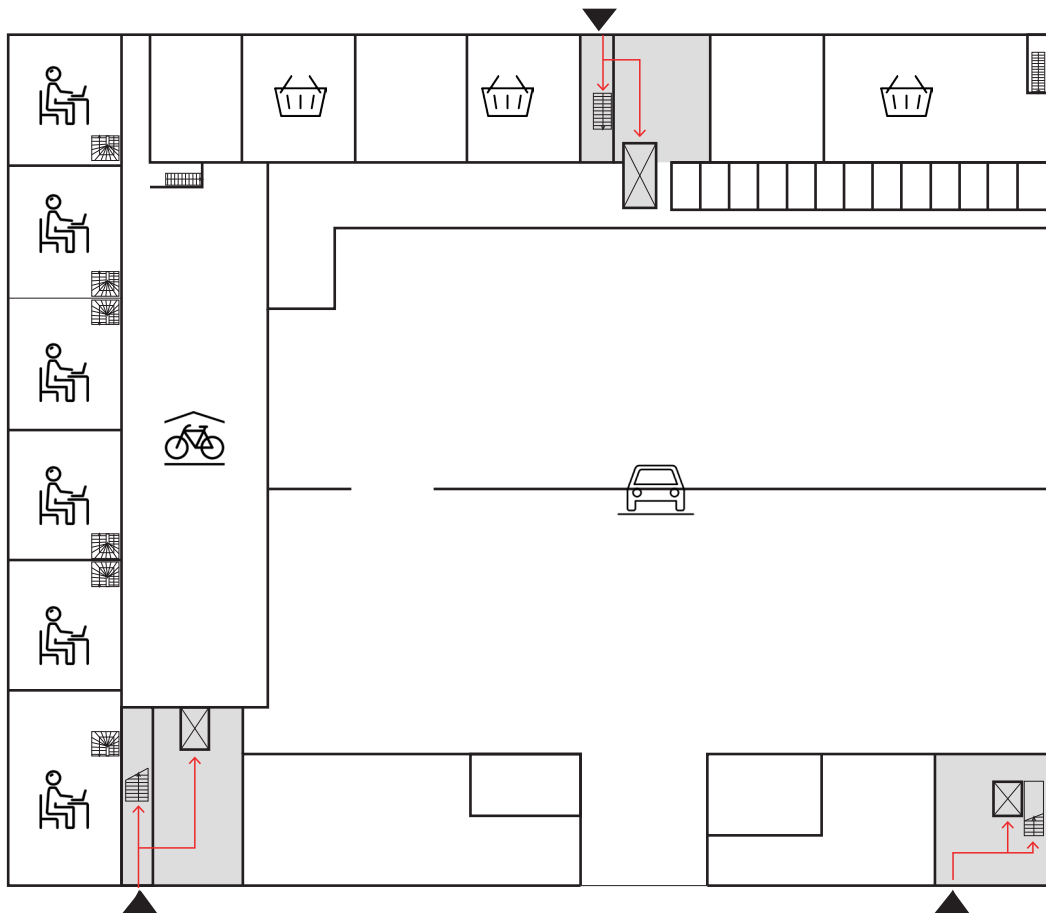
- Shared amenities
- Open floor plan
- Cluster services
- Narrow dwellings



## CASE STUDIES

### Ground floor

The ground floor of XS Deluxe has a public plinth. Working and retail spaces are located on two sides of the ground floor. A bike shed and car parking are also situated on this floor.

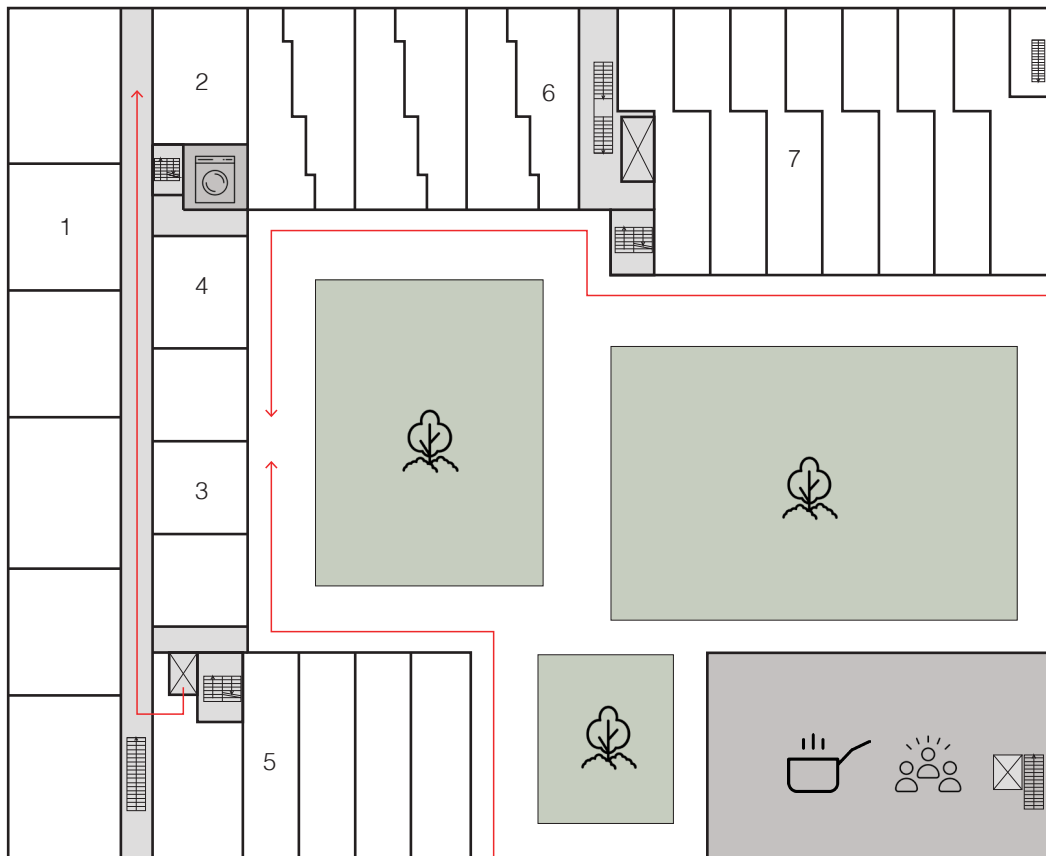


-  Circulation
-  Communal space
-  Outdoor
-  Public

# CASE STUDIES

## 1st floor

The first floor has a inner courtyard with a raised garden for collective use. Most of the apartments on this floor are ground bound. Collective amenities like laundry facilities, collective living room and cooking studio are also located on this floor.

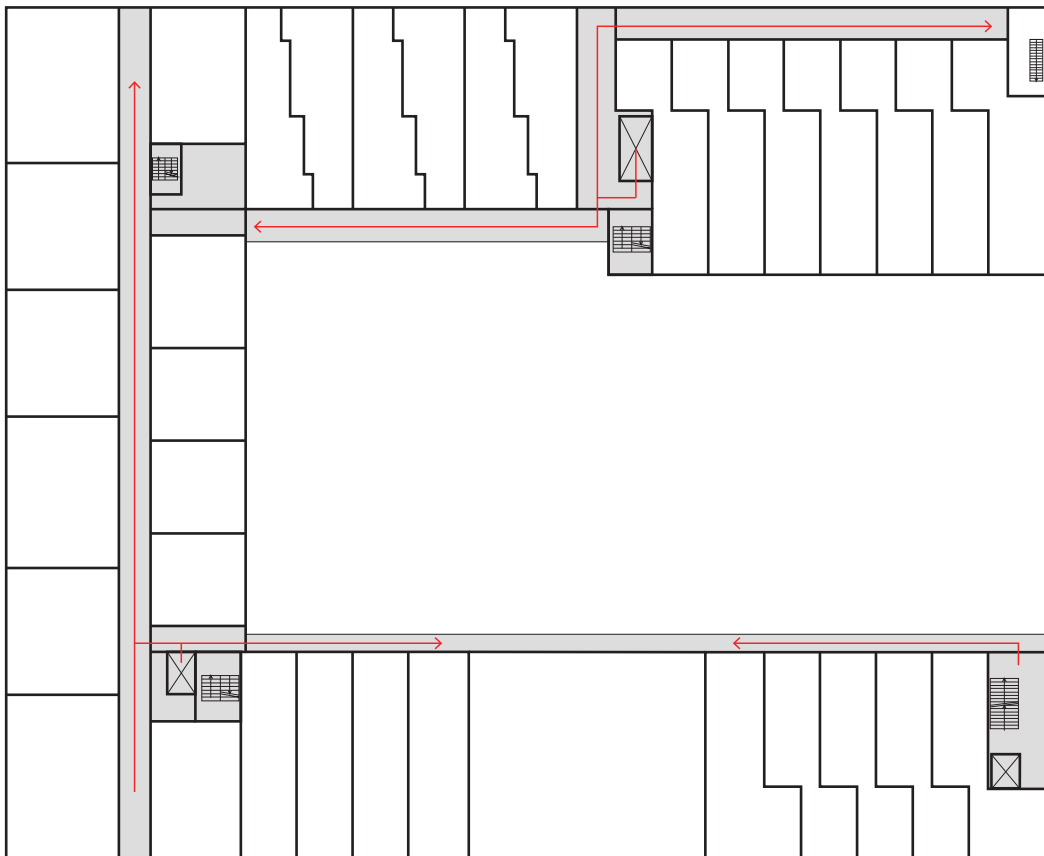


-  Circulation
-  Communal space
-  Outdoor
-  Public

# CASE STUDIES

Floor 2 - 4

The access of the apartments on the upper floors is organized through corridors and galleries.

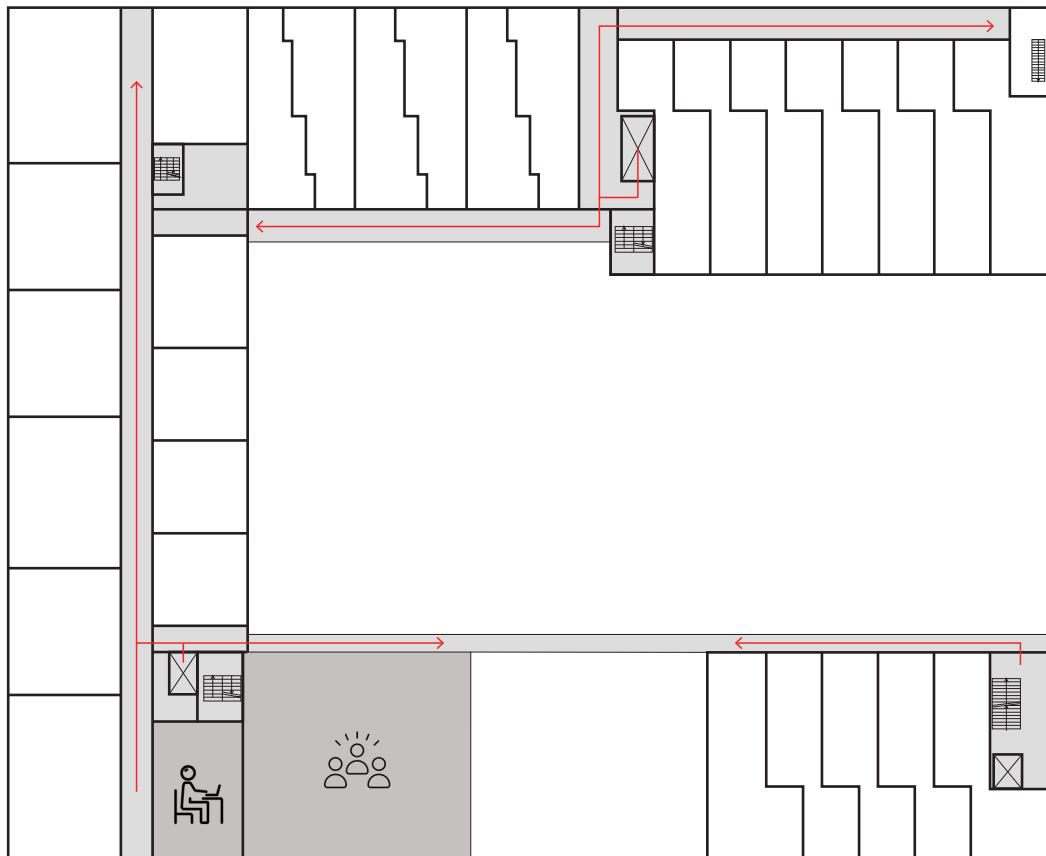


-  Circulation
-  Communal space
-  Outdoor
-  Public

# CASE STUDIES

## 5th floor

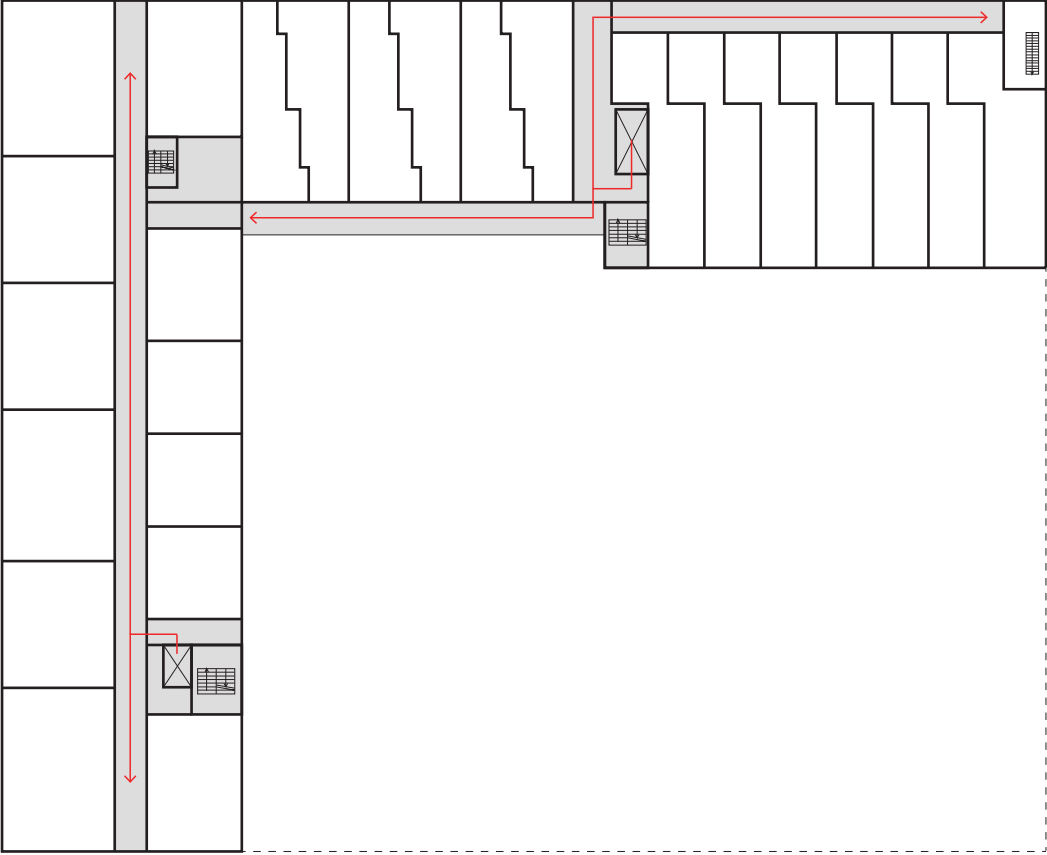
Next to the shared working spaces on the 5th floor is a collective terrace.







-  Circulation
-  Communal space
-  Outdoor
-  Public

# CASE STUDIES

Floor 6 - 8



-  Circulation
-  Communal space
-  Outdoor
-  Public

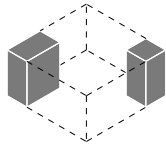
# CASE STUDIES

## Unit 1

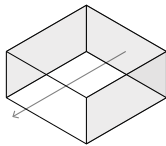
This single orientated unit is exceptional since it is relatively big and has an outdoor space. The bathroom and kitchen are not connected but located on both sides of the entrance. Because of its size, the percentage of facade is relatively high.

### Dwelling information

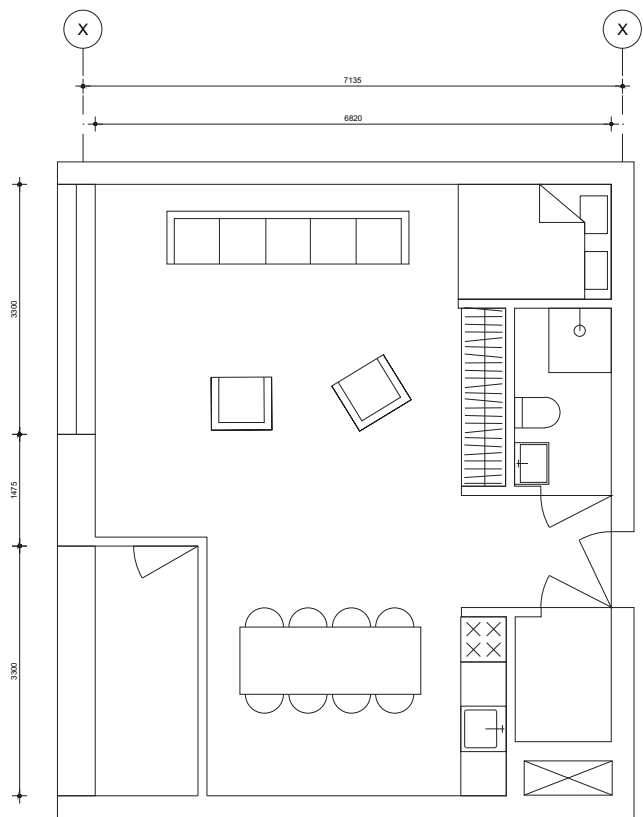
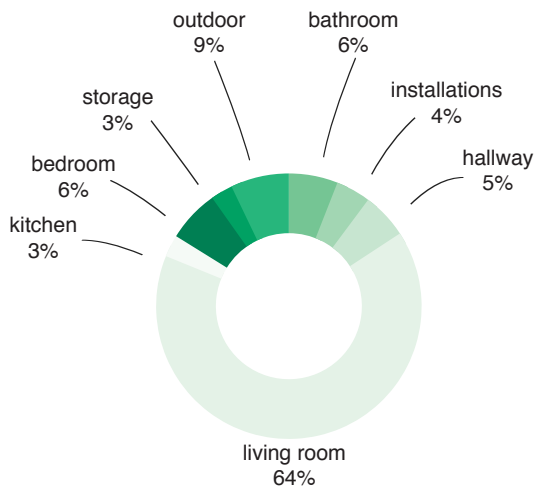
Height	2,8 m
Bathroom	3,1 m <sup>2</sup>
Installations	2,2 m <sup>2</sup>
Hallway	2,9 m <sup>2</sup>
Living room	34 m <sup>2</sup>
Kitchen	1,4 m <sup>2</sup>
Bedroom	3,3 m <sup>2</sup>
Storage	1,4 m <sup>2</sup>
Outdoor	4,5 m <sup>2</sup>
<b>Total</b>	<b>52,8 m<sup>2</sup></b>
Facade - wall %	27 - 73



Separated services



Single orientated



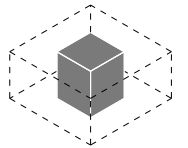
# CASE STUDIES

## Unit 2

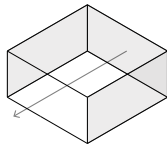
In this unit the services are located in the center of the apartment. Since this is inefficiently designed, it results in a lot of circulation square meters. 26% percent of the square meters is hallway.

### Dwelling information

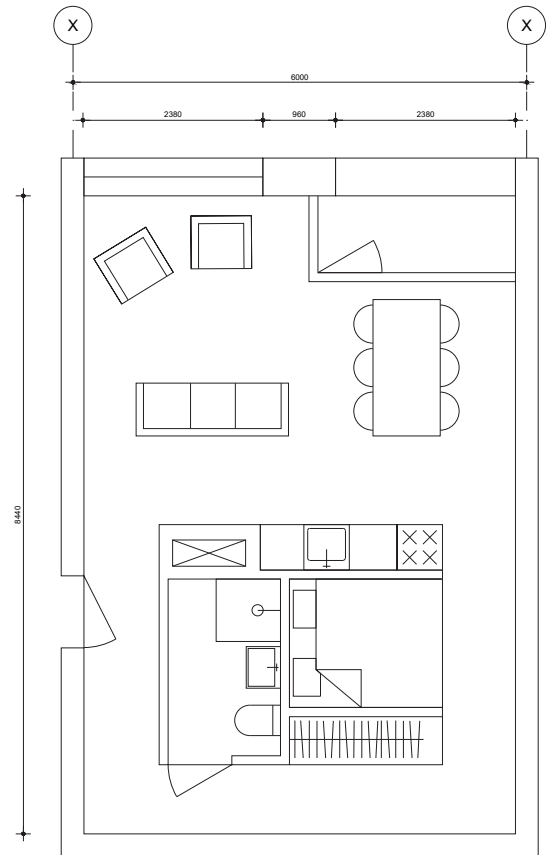
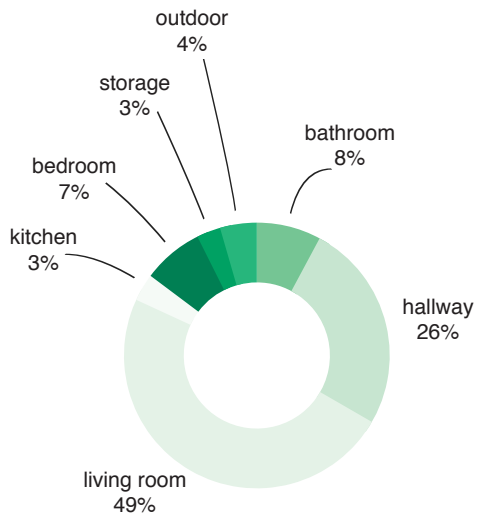
Height	2,8 m
Bathroom	3,5 m <sup>2</sup>
Installations	- m <sup>2</sup>
Hallway	11,4 m <sup>2</sup>
Living room	21,7 m <sup>2</sup>
Kitchen	1,5 m <sup>2</sup>
Bedroom	3,3 m <sup>2</sup>
Storage	1,3 m <sup>2</sup>
Outdoor	2,7 m <sup>2</sup>
<b>Total</b>	<b>45,4 m<sup>2</sup></b>
Facade - wall %	20 - 80



Services in centre



Single orientated





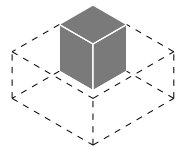
# CASE STUDIES

## Unit 3

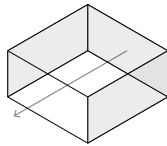
Because there are no separate bedroom or kitchen, most of the square meters are dedicated to the living room. This results in a open and spacious floor plan on a small surface.

### Dwelling information

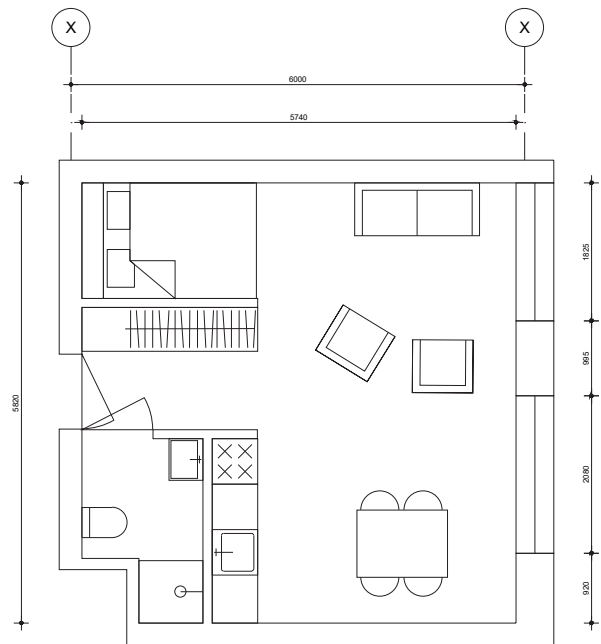
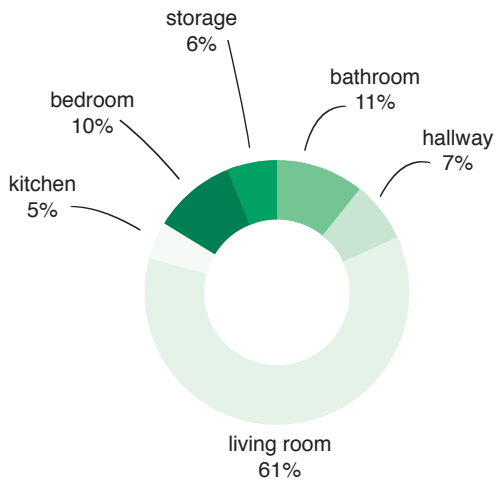
Height	2,8 m
Bathroom	3,4 m <sup>2</sup>
Installations	- m <sup>2</sup>
Hallway	2,4 m <sup>2</sup>
Living room	19,9 m <sup>2</sup>
Kitchen	1,5 m <sup>2</sup>
Bedroom	3,3 m <sup>2</sup>
Storage	1 m <sup>2</sup>
Outdoor	- m <sup>2</sup>
<b>Total</b>	<b>31,5 m<sup>2</sup></b>
Facade - wall %	25 - 75



Services in corner



Single orientated



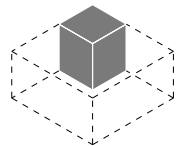
# CASE STUDIES

## Unit 4

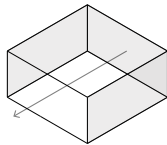
Unit 4 is the bigger option of unit 3. The wider apartment has more storage room and a bigger living area. Because it is wider and not deeper, the ratio of facade and construction wall because more inefficient.

### Dwelling information

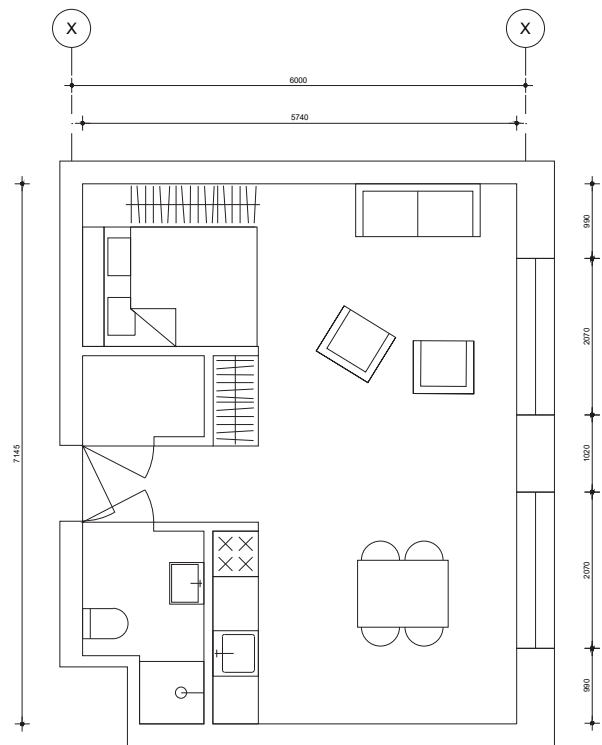
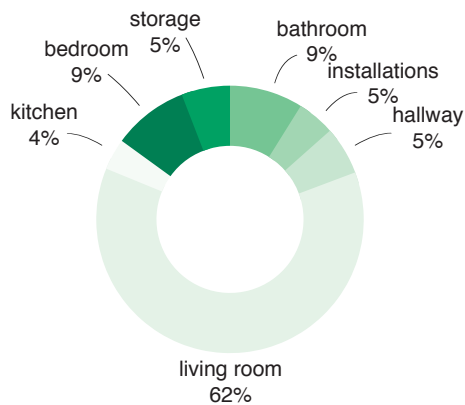
Height	2,8 m
Bathroom	3,5 m <sup>2</sup>
Installations	1,8 m <sup>2</sup>
Hallway	2,3 m <sup>2</sup>
Living room	24,4 m <sup>2</sup>
Kitchen	1,5 m <sup>2</sup>
Bedroom	3,6 m <sup>2</sup>
Storage	2 m <sup>2</sup>
Outdoor	- m <sup>2</sup>
<b>Total</b>	<b>39,1 m<sup>2</sup></b>
Facade - wall %	27 - 73



Services in corner



Single orientated



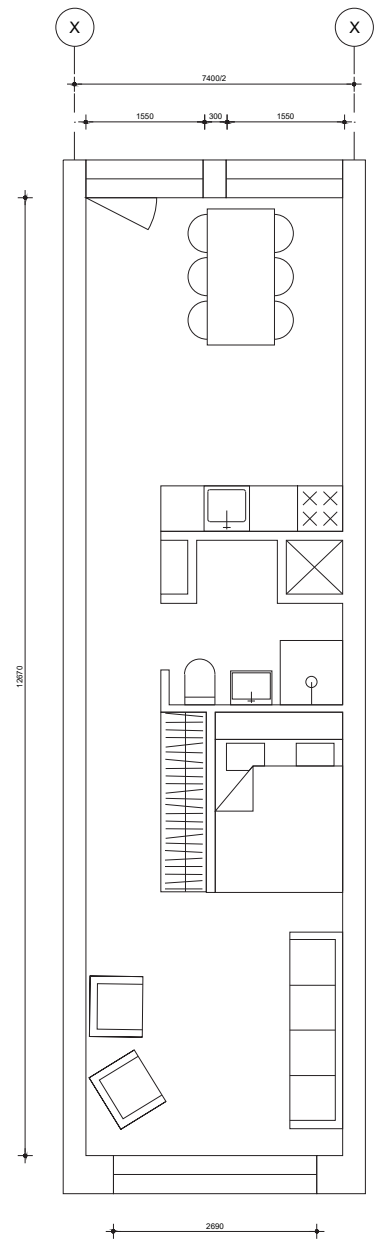
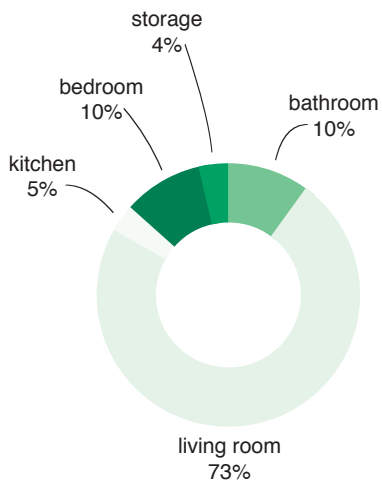
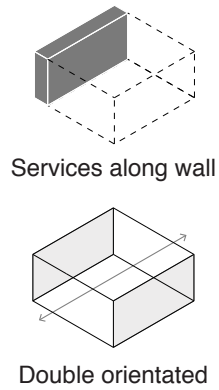
# CASE STUDIES

## Unit 5

A narrow unit with the services in the middle along the wall as a space divider. Together with the double orientation the apartment is suitable for couples.

### Dwelling information

<b>Height</b>	<b>2,8 m</b>
Bathroom	3,5 m <sup>2</sup>
Installations	1,8 m <sup>2</sup>
Hallway	- m <sup>2</sup>
Living room	30,1 m <sup>2</sup>
Kitchen	1,4 m <sup>2</sup>
Bedroom	4 m <sup>2</sup>
Storage	1,4 m <sup>2</sup>
Outdoor	- m <sup>2</sup>
<b>Total</b>	<b>41 m<sup>2</sup></b>
<b>Facade - wall %</b>	<b>23 - 77</b>



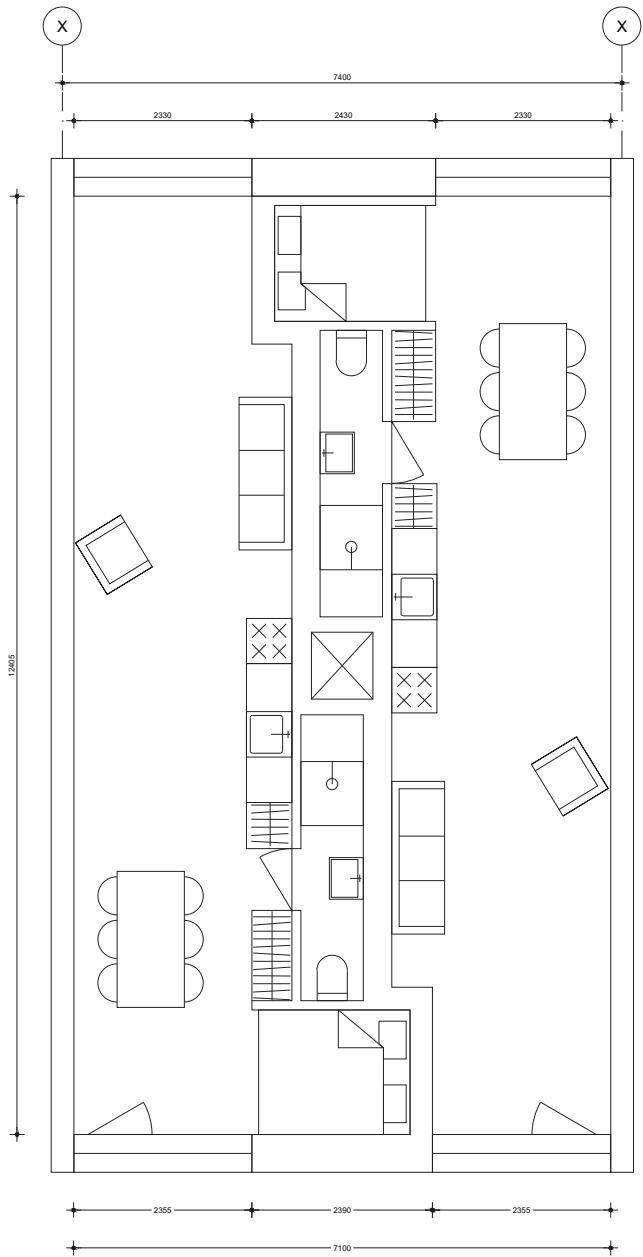
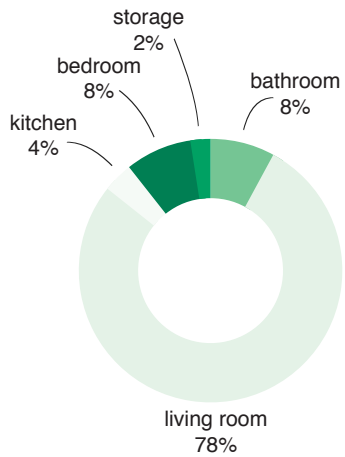
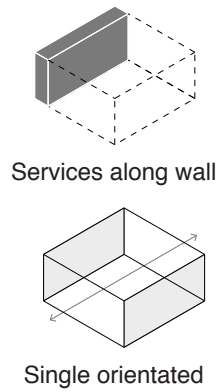
# CASE STUDIES

## Unit 6

Unit type 6 fits in each other like a puzzle. A narrow floor plan with the services located along the wall. The entrance is right in the living room, with no hallway.

### Dwelling information

Height	2,8 m
Bathroom	3,2 m <sup>2</sup>
Installations	- m <sup>2</sup>
Hallway	- m <sup>2</sup>
Living room	31,5 m <sup>2</sup>
Kitchen	1,5 m <sup>2</sup>
Bedroom	3,3 m <sup>2</sup>
Storage	1 m <sup>2</sup>
Outdoor	- m <sup>2</sup>
<b>Total</b>	<b>40,5 m<sup>2</sup></b>
Facade - wall %	24 - 76



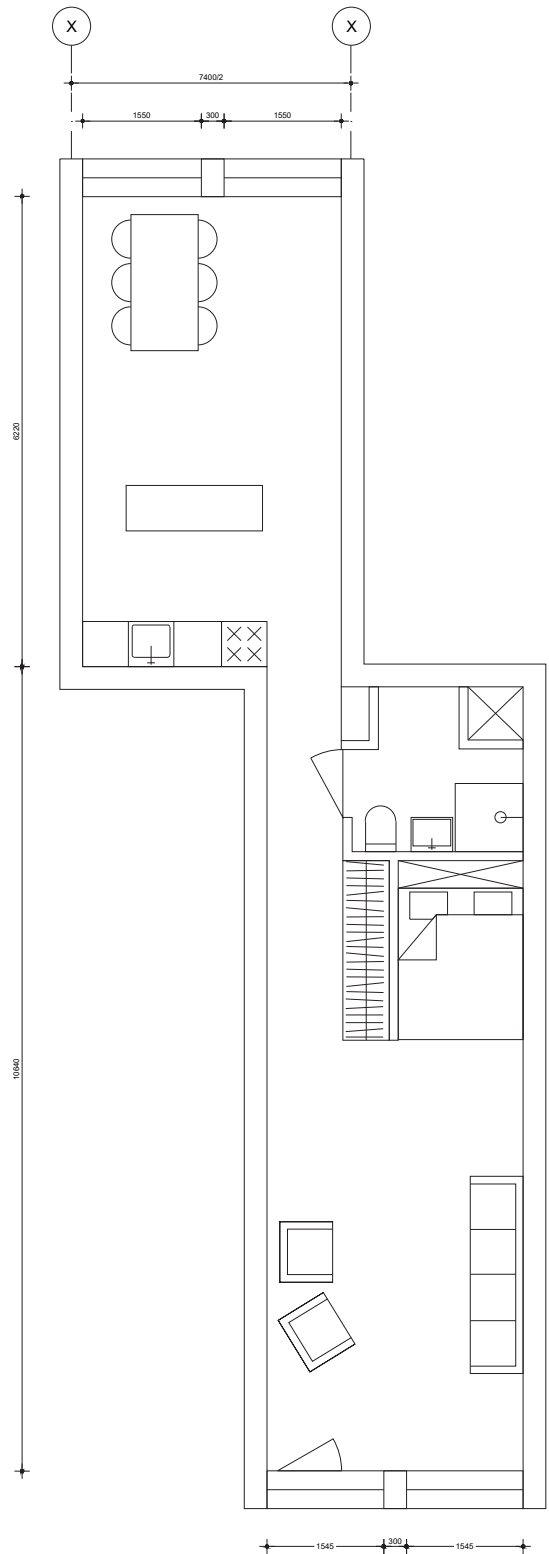
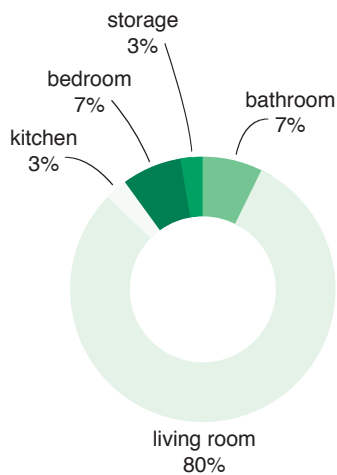
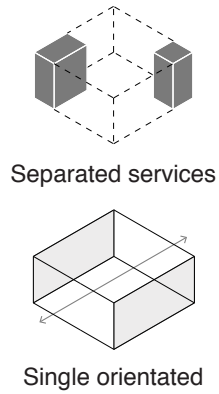
# CASE STUDIES

## Unit 7

Unit 6 is the biggest apartment of XS Deluxe Houthavens. The apartment is separated in two living areas. Because of its length, the ratio facade - construction wall is highly efficient.

### Dwelling information

Height	2,8 m
Bathroom	4 m <sup>2</sup>
Installations	- m <sup>2</sup>
Hallway	- m <sup>2</sup>
Living room	44 m <sup>2</sup>
Kitchen	1,5 m <sup>2</sup>
Bedroom	4 m <sup>2</sup>
Storage	1,5 m <sup>2</sup>
Outdoor	- m <sup>2</sup>
<b>Total</b>	<b>55 m<sup>2</sup></b>
Facade - wall %	16 - 84



## CASE STUDIES

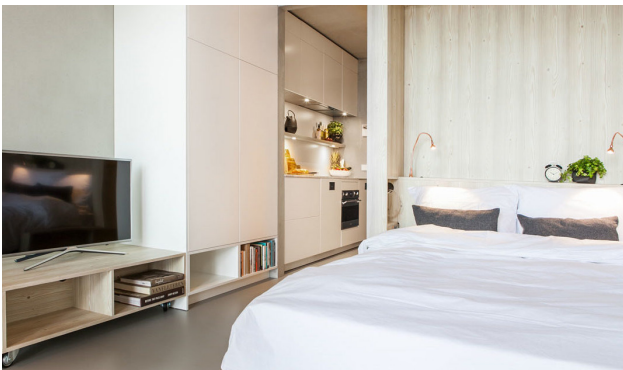
North Orleans, Amsterdam



North Orleans (Flickr.com)



North Orleans unit interior (Northorleans.nl)



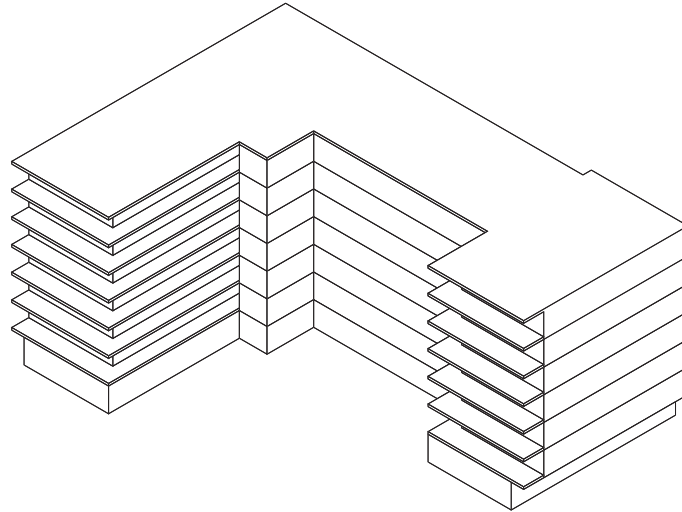
North Orleans unit interior (Northorleans.nl)

North Orleans is a housing project in the north of Amsterdam. Originally the complex of 120 apartments was designed for students. Since there were no restrictions on the maximum rent, the developer raised the prices enormously. At the moment, 80% to 90% percent of the inhabitants is foreigner, mostly ex-pats. The apartments are similar to hotel rooms, all the services like room cleaning, bike usage, electricity, water and WiFi are included in the monthly fee. Every apartment is completely furnished, including a bed that folds away in the sofa.

Although the apartments are small, compared to the other case studies there are very little shared amenities. Besides a collective garden the lobby is the only collective space within the building. On the ground floor several public restaurants and cafés serve the complex and neighborhood.

# CASE STUDIES

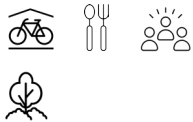
Info-graphic



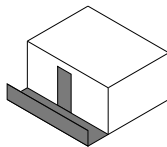
## Complex

## Units

### Amenities



### Access

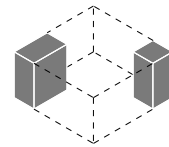


### Dwellings

Dwellings 120  
Types 1

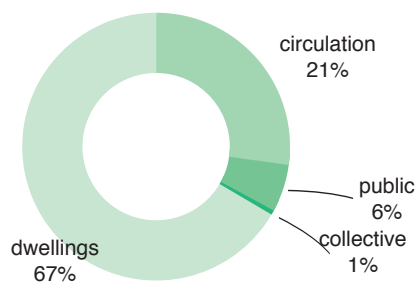
Standard width 3700 mm

### Unit types



### Square meters

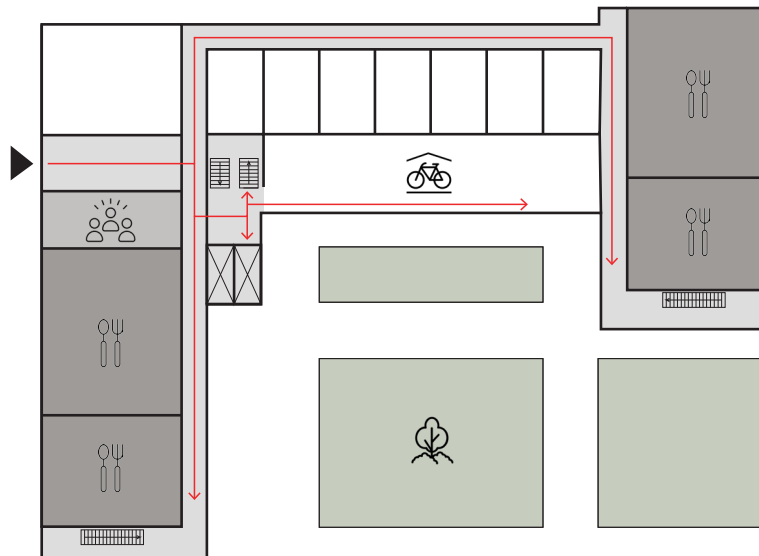
Dwellings	3.940 m <sup>2</sup>
Collective	32 m <sup>2</sup>
Public	340 m <sup>2</sup>
Circulation	1.610 m <sup>2</sup>





## CASE STUDIES

### Ground floor

All the public and collective functions are located on the ground floor. Four restaurants/bars are located on two sides of the design. Next to the entrance is a small lobby where inhabitants can relax. The bike shed is where the bikes are stored which are included in the monthly fee. In the collective garden the inhabitants can meet each other, for instance during a barbecue.



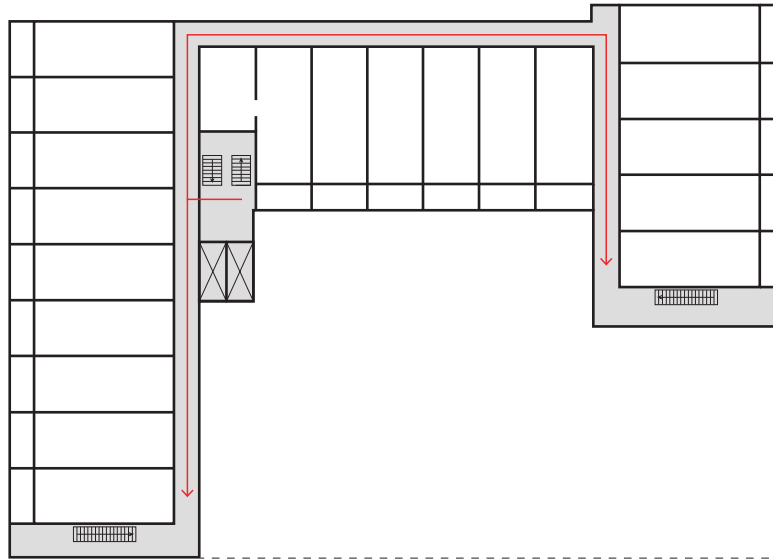
-  Circulation
-  Communal space
-  Outdoor
-  Public



# CASE STUDIES

Floor 1 - 6

All the upper floors are similar. The apartments are all accessed through galleries.



-  Circulation
-  Communal space
-  Outdoor
-  Public

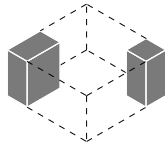
# CASE STUDIES

## Unit

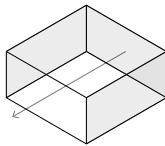
Because of the narrow design and its single orientation the facade - construction wall ratio is very cost efficient. The flexible bed design saves space in the living room.

### Dwelling information

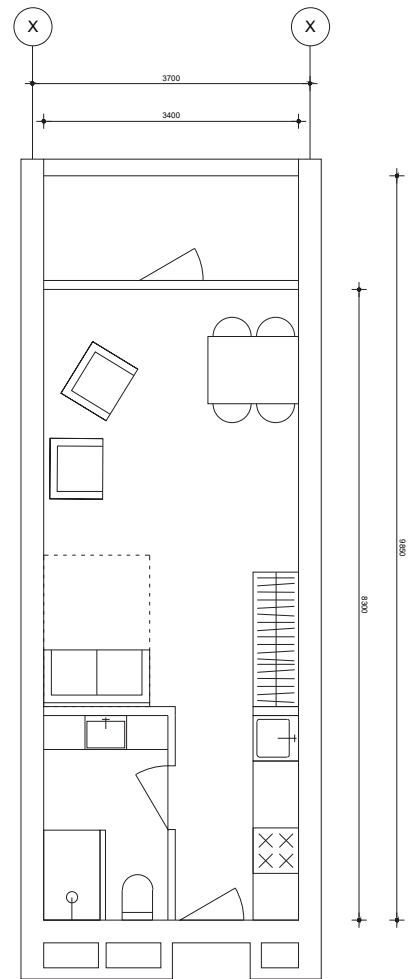
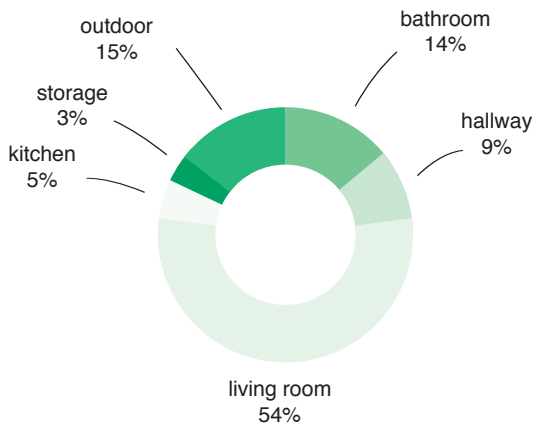
Height	2,8 m
Bathroom	4,5 m <sup>2</sup>
Installations	- m <sup>2</sup>
Hallway	2,9 m <sup>2</sup>
Living room	17,5 m <sup>2</sup>
Kitchen	1,6 m <sup>2</sup>
Bedroom	- m <sup>2</sup>
Storage	1,1 m <sup>2</sup>
Outdoor	4,7 m <sup>2</sup>
<b>Total</b>	<b>32,8 m<sup>2</sup></b>
Facade - wall %	13 - 87



Separated services



Single orientated





## CASE STUDIES

### De Lofts, Amsterdam



De Lofts ([hurenindelofts020.nl](http://hurenindelofts020.nl))



De Lofts entrance ([hurenindelofts020.nl](http://hurenindelofts020.nl))



De Lofts roof terrace ([hurenindelofts020.nl](http://hurenindelofts020.nl))

The Lofts is a new project in the Amstelkwartier, a new district in Amsterdam, directly on the Amstel. In addition to the affordable compact houses, special to the project is the community idea, in which facilities are shared. The Lofts therefore focuses on young people born between 1980 and 2000, the millennials who are also called young professionals. This target group buys a house at a later age, attaches less value to property and wants to share facilities.

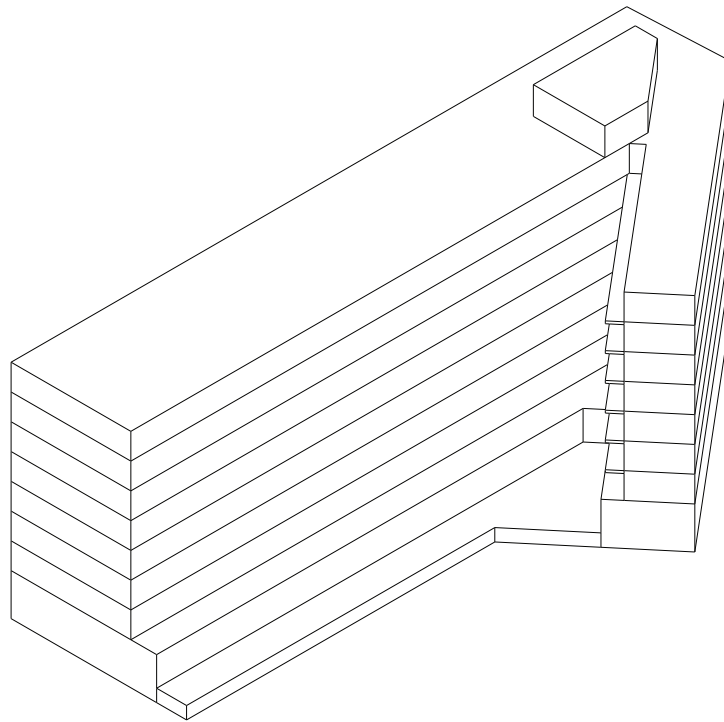
The Lofts consists of 212 rental apartments divided over eight floors. These are compact studios and two-room apartments.

Beside their own apartment, on the ground floor residents can use various communal areas, such as a living room, library, work spaces and a laundry. These areas offer an opportunity to meet each other. There is also a communal roof terrace with a view over the city. The other spaces at the plinth are arranged as a gym for yoga and CrossFit or other functions for relaxation. In addition, the complex also has a parking garage and a communal bicycle parking.

The project was designed by Inbo architects. Large windows give the apartments a light and spacious feel and are inspired by New York lofts.

# CASE STUDIES

## Info-graphic



### Complex

### Units

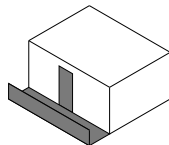
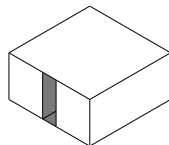
#### Amenities



#### Square meters

Dwellings	7.317 m <sup>2</sup>
Collective	520 m <sup>2</sup>
Public	519 m <sup>2</sup>
Circulation	2.201 m <sup>2</sup>

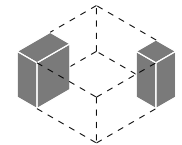
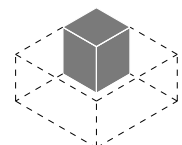
#### Access



#### Dwellings

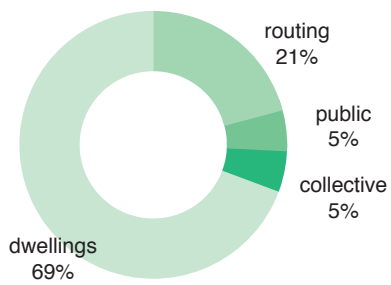
Dwellings	212
Types	5
Standard widths	5700 mm ± 6000 mm

#### Unit types



#### Solutions

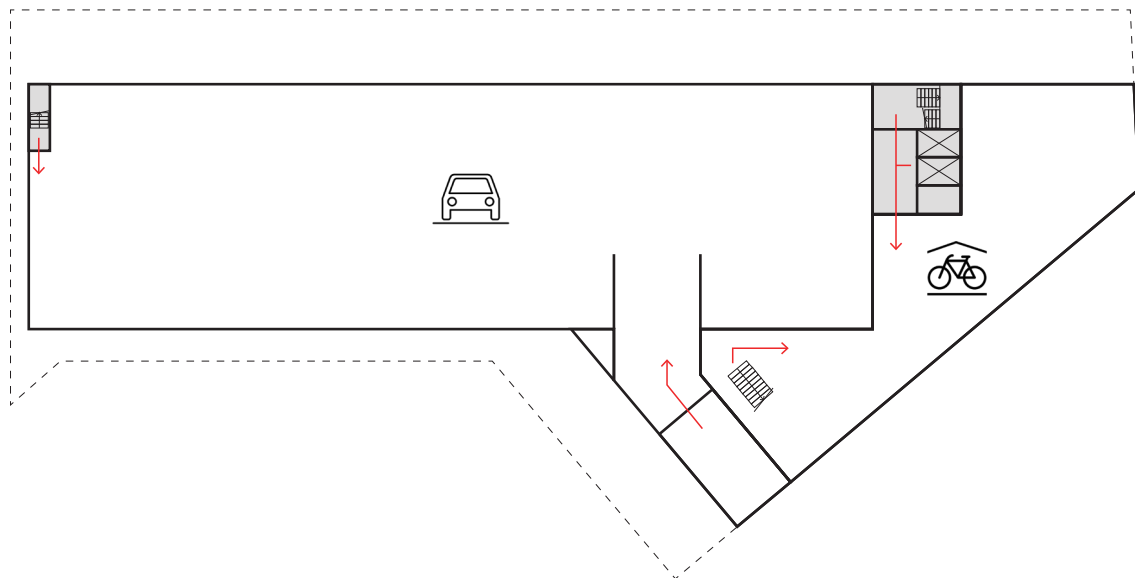
- Shared amenities
- Open floor plan
- Cluster services
- Folding bed system
- Storage walls
- High window openings
- Sliding doors



## CASE STUDIES

### Basement -2 (-1)

On this floor the common bicycle parking is located. This space has a double height but most of the basement actually consists of two floors. Therefore, the parking garage consists of two layers. Cars enter via a lift system.

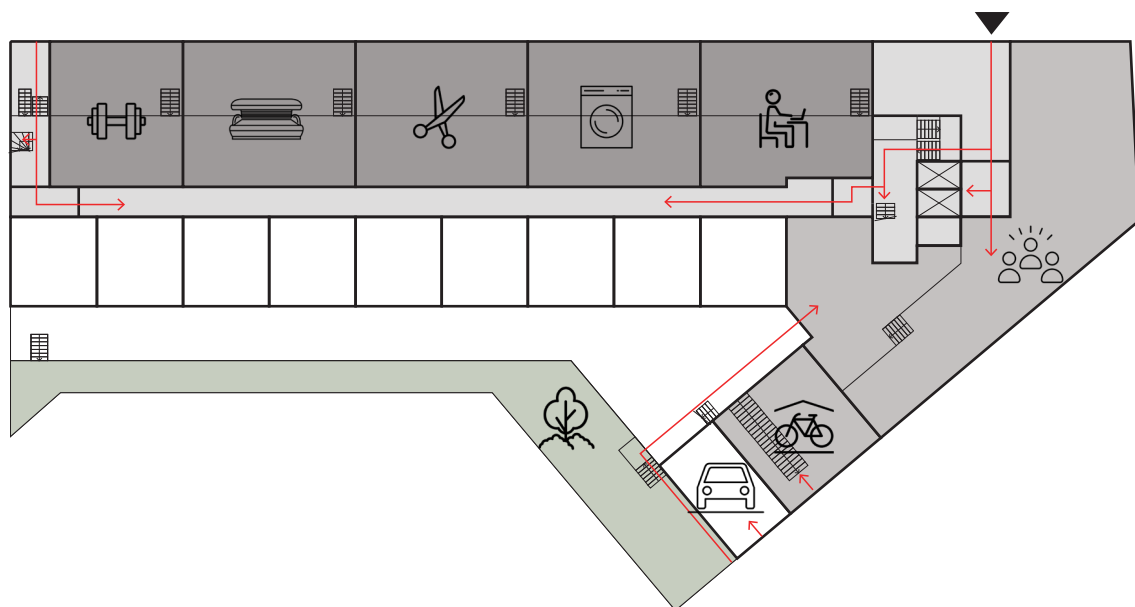


- ◻ Circulation
- ◻ Communal space
- ◻ Outdoor
- ◻ Public

## CASE STUDIES

### Ground floor

There are a number of commercial spaces in the plinth of the building. Such as a hairdresser and a tanning salon. These areas are only accessible from the street. The Lofts has a spacious entrance that has a direct connection to the communal living room. The apartments on the ground floor have a small outdoor space. In addition, there is a small strip of greenery that can be used by all residents. The bicycle storage is accessible via a staircase

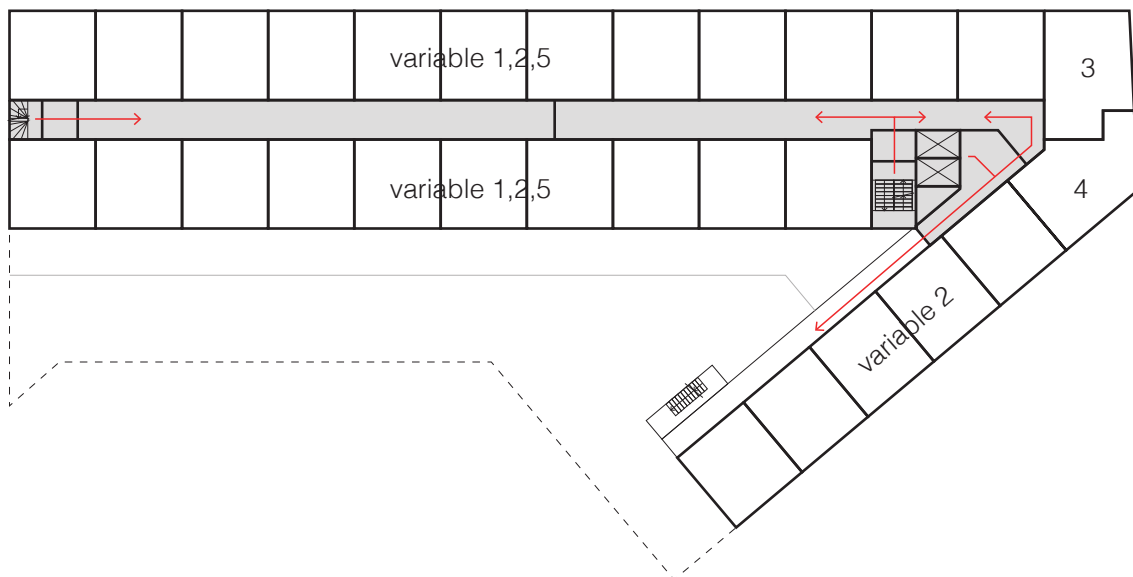




-  Circulation
-  Communal space
-  Public
-  Outdoor

# CASE STUDIES

Floor 1 - 7

Only apartments are located on these floors. They are made accessible through a corridor and gallery principle. Only on the first floor on the north side the apartments have an outdoor space.



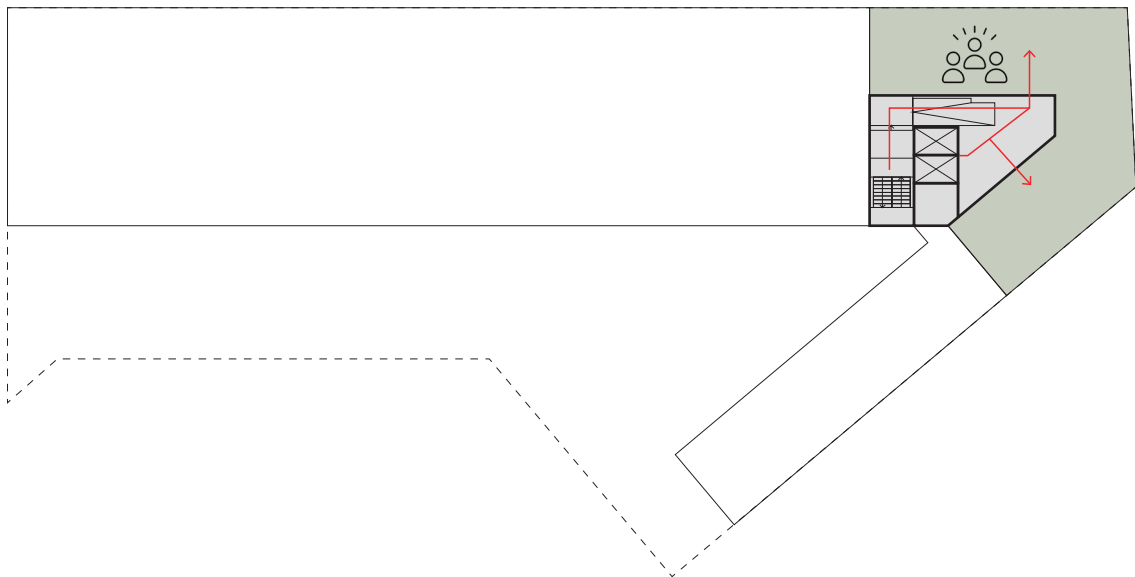
-  Circulation
-  Communal space
-  Outdoor
-  Public



# CASE STUDIES

8th floor

On this floor the communal terrace of about 185 m<sup>2</sup> is located, with views over the city. The rest of the roof is reserved for PV cells.



-  Circulation
-  Communal space
-  Outdoor
-  Public

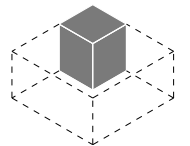
# CASE STUDIES

## Unit 1

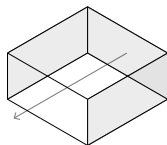
This apartment has a separate bedroom, which can be closed with a large sliding wall. The open sliding wall provides light in this room because the bedroom itself has no window openings. Therefore, the living room has a large window surface that occur in all units. The living room and bedroom are separated by a storage element. The kitchen and the bathroom are connected to each other. Where most dwellings in this complex have the installation space in the common corridor, it is now located in the dwelling itself.

### Dwelling information

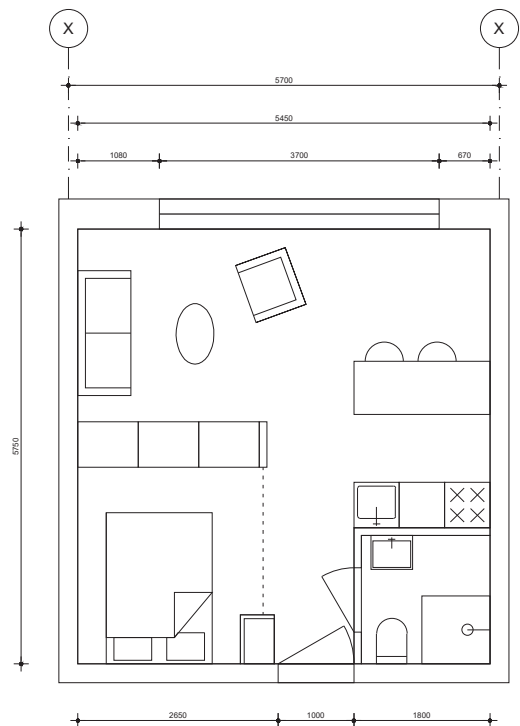
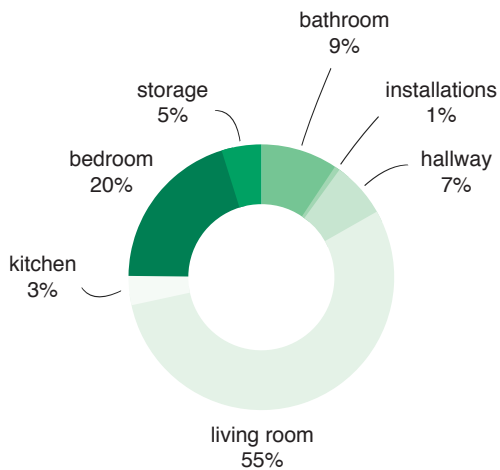
Height	2,75 m
Bathroom	2,9 m <sup>2</sup>
Installations	0,2 m <sup>2</sup>
Hallway	2,1 m <sup>2</sup>
Living room	17,0 m <sup>2</sup>
Kitchen	1,1 m <sup>2</sup>
Bedroom	6,2 m <sup>2</sup>
Storage	1,5 m <sup>2</sup>
Outdoor	- m <sup>2</sup>
<b>Total</b>	<b>31,0 m<sup>2</sup></b>
Facade - wall %	24 - 76



Services in corner



Single orientated



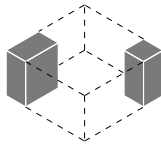
# CASE STUDIES

## Unit 2

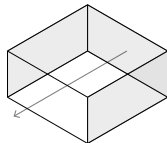
This apartment has the same surface as unit 1. However, in this variant the bed is located in the living room. This bed folds into a closet element. This creates a relatively larger living room. Storage is located both in the living room and in the hallway. The kitchen and bathroom are separated from each other.

### Dwelling information

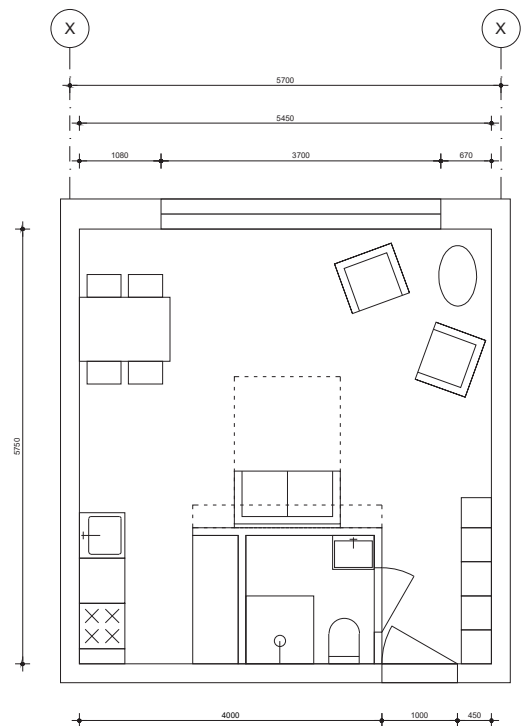
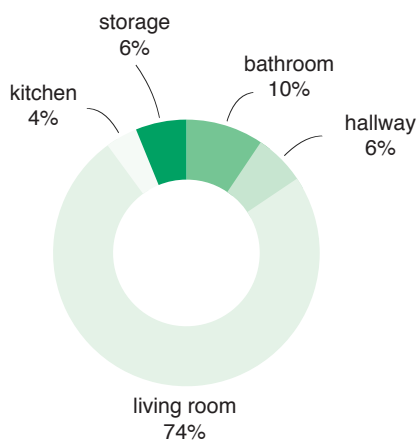
Height	2,75 m
Bathroom	2,9 m <sup>2</sup>
Installations	- m <sup>2</sup>
Hallway	1,9 m <sup>2</sup>
Living room	22,9 m <sup>2</sup>
Kitchen	1,2 m <sup>2</sup>
Bedroom	- m <sup>2</sup>
Storage	1,9 m <sup>2</sup>
Outdoor	- m <sup>2</sup>
<b>Total</b>	<b>30,8 m<sup>2</sup></b>
Facade - wall %	24 - 76



Separated services



Single orientated



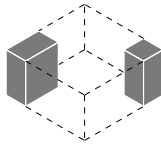
# CASE STUDIES

## Unit 3

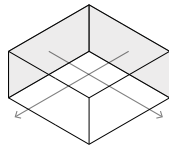
This corner apartment has a separate bedroom, which can be connected to the living room with sliding doors. A closed bedroom does have its own window opening. However, to enter the bathroom with the toilet, one has to go via the bedroom. There are storage facilities in the hallway, living room and bedroom. The bathroom and kitchen are separated from each other.

### Dwelling information

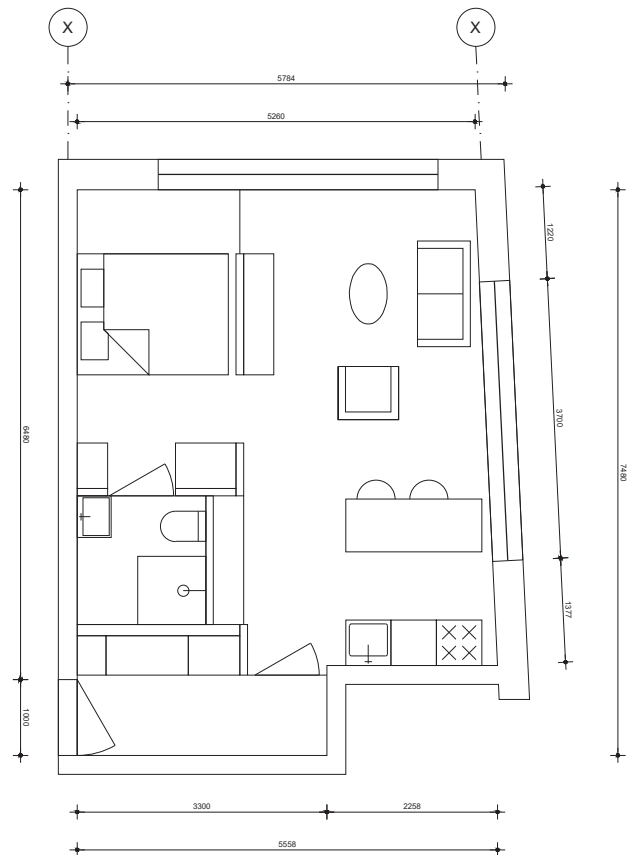
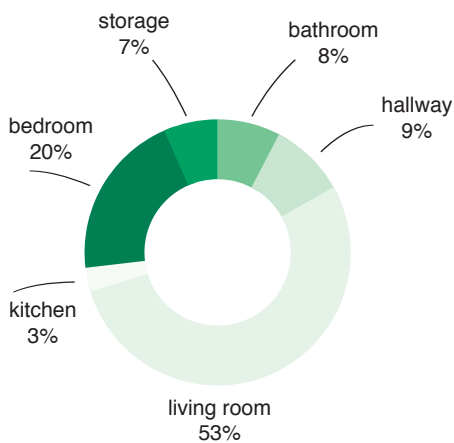
Height	2,75 m
Bathroom	2,9 m <sup>2</sup>
Installations	- m <sup>2</sup>
Hallway	3,5 m <sup>2</sup>
Living room	20,3 m <sup>2</sup>
Kitchen	1,1 m <sup>2</sup>
Bedroom	7,7 m <sup>2</sup>
Storage	2,5 m <sup>2</sup>
Outdoor	- m <sup>2</sup>
<b>Total</b>	<b>38,0 m<sup>2</sup></b>
Facade - wall %	45 - 55



Separated services



Corner orientated



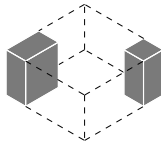
# CASE STUDIES

## Unit 4

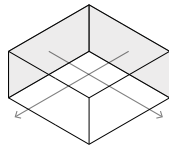
This corner apartment has a separate bedroom, living room and bathroom. In this case the bedroom also has its own window opening. In addition, the bathroom and the living room are separated by a closed hallway. Also the kitchen and bathroom are now separated from each other. Storage is only possible in the bedroom which can be entered through a sliding doors.

### Dwelling information

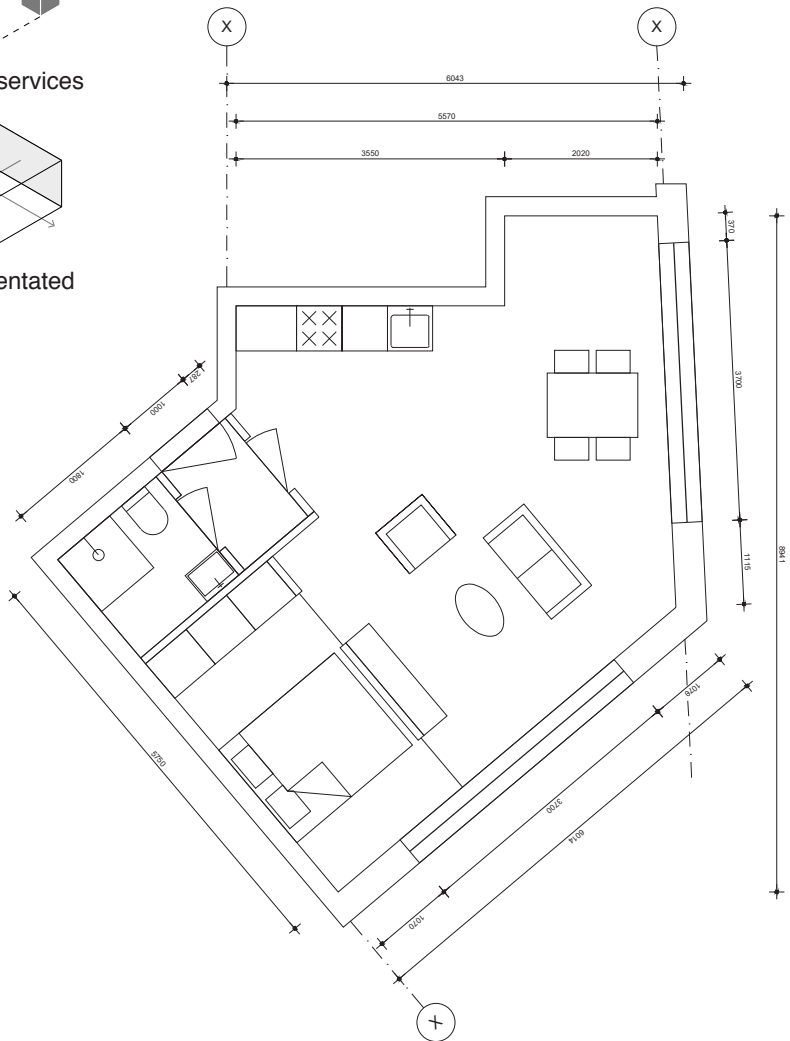
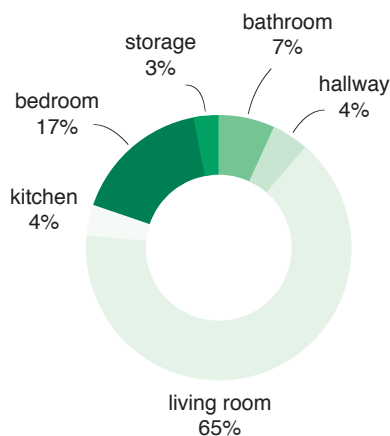
Height	2,75 m
Bathroom	2,9 m <sup>2</sup>
Installations	- m <sup>2</sup>
Hallway	1,9 m <sup>2</sup>
Living room	27,7 m <sup>2</sup>
Kitchen	1,6 m <sup>2</sup>
Bedroom	7,1 m <sup>2</sup>
Storage	1,3 m <sup>2</sup>
Outdoor	- m <sup>2</sup>
<b>Total</b>	<b>42,5 m<sup>2</sup></b>
Facade - wall %	39 - 61



Separated services



Corner orientated



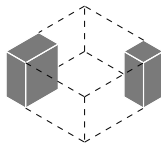
# CASE STUDIES

## Unit 5

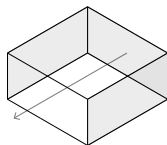
This apartment has the same surface as unit 1 and 2. The apartment has a separate bedroom with its own window opening. However, to reach the bathroom with toilet, this must be via the bedroom. The bedroom can be closed with sliding doors. A storage element creates a hallway between the kitchen and the bathroom. Because of all this separated spaces, the dwelling has a relatively small living room.

### Dwelling information

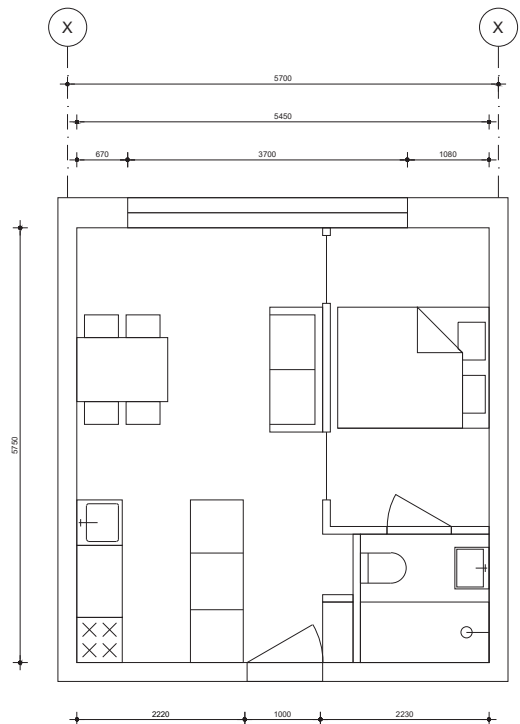
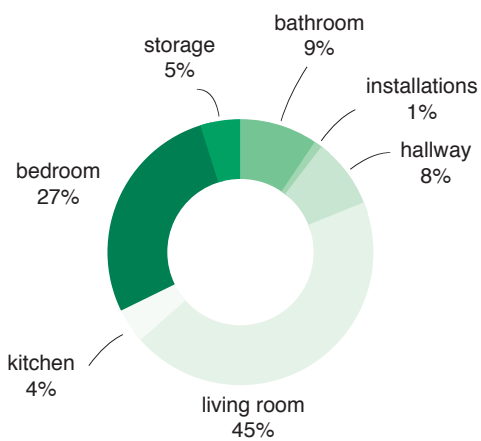
Height	2,75 m
Bathroom	2,9 m <sup>2</sup>
Installations	0,3 m <sup>2</sup>
Hallway	2,6 m <sup>2</sup>
Living room	13,7 m <sup>2</sup>
Kitchen	1,3 m <sup>2</sup>
Bedroom	8,4 m <sup>2</sup>
Storage	1,5 m <sup>2</sup>
Outdoor	- m <sup>2</sup>
<b>Total</b>	<b>30,7 m<sup>2</sup></b>
Facade - wall %	24 - 76



Separated services



Single orientated





## CASE STUDIES

Carmel place, New York



*Carmel Place (designboom.com)*



*Carmel Place bird view (narchitects.com)*



*Carmel Place interior (businessinsider.com)*

Just like in Amsterdam, New York also has a shortage of affordable housing. nARCHITECTS came up with a smart solution to this problem; modular apartments intended for people who live with a relatively low income, live alone or with 2 people and do not need much space, but would like to live in the center. The aim was to provide a new social framework for small households that emphasizes nested scales of community rather than individual residents. Carmel Place is located in Manhattan in the Kips Bay district.

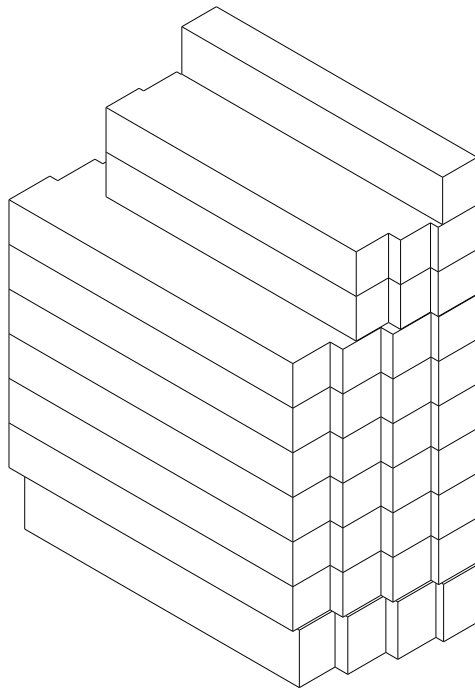
The complex consists of 55 residential containers stacked on top of each other with an area of around 30 m<sup>2</sup>. These containers are first prefabricated and later on stacked on the building site. The complex has 9 floors with a floor height of about 3 meters. Each house has a Juliette balcony and concealed storage space near the ceiling. One of the reasons that this is a special project is that New York has a special rule. Apartments can not be smaller than 37 square meters. But because of New York's interest in affordable housing, they deviated from this rule.

In exchange for small, single-occupancy units, residents could share amenities-like a restaurant-kitchen, dining area, lounge, and cleaning services. The apartments are furnished, have a virtual doorman and have all access to an outdoor terrace, a fitness room, bicycle storage, game room, study room and laundry.



# CASE STUDIES

## Info-graphic



### Complex

### Units

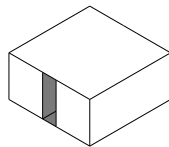
#### Amenities



#### Square meters

Dwellings	2,057 m <sup>2</sup>
Collective	318 m <sup>2</sup>
Public	70 m <sup>2</sup>
Circulation	927 m <sup>2</sup>

#### Access

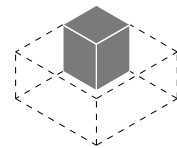
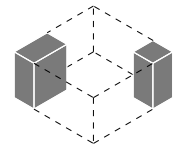


#### Dwellings

Dwellings 55  
Types 7

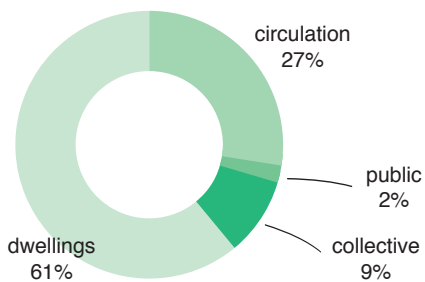
Standard widths 4940 mm  
4575 mm  
4630 mm  
3470 mm  
3395 mm  
3420 mm

#### Unit types



#### Solutions

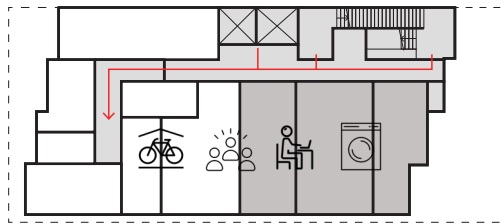
- Shared amenities
- Open floor plan
- Cluster services
- Narrow dwellings
- Folding bed system
- High window openings
- Juliette balcony
- Folding bed system
- Storage walls
- Overhead storage



## CASE STUDIES

### Basement -1

On this floor there several communal areas are located. In addition to the bicycle storage, there is also a room for study, a game room, storage and a laundry room.

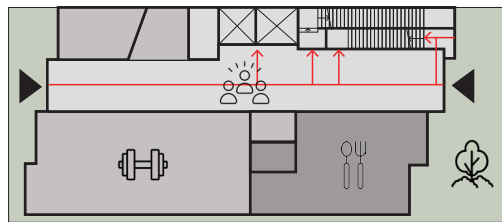


-  Circulation
-  Communal space
-  Outdoor
-  Public

## CASE STUDIES

### Ground floor

The spacious entrance can be accessed on two sides. The entrance offers direct access to the sports room and the small communal living room. The entrance / lobby is also called the residential street. The restaurant is only accessible via the public street. The bicycle storage can be accessed via a staircase at one side of the building. On the ground floor there is also a small communal garden.

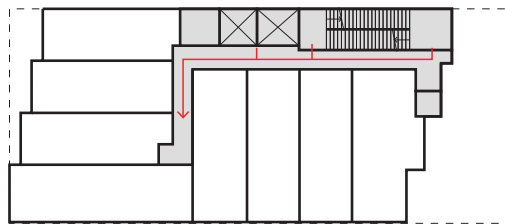


-  Circulation
-  Communal space
-  Outdoor
-  Public

# CASE STUDIES

Floor 1 - 6

Only apartments are located on these floors. They are made accessible through a corridor principle. All apartments have a Juliette balcony.

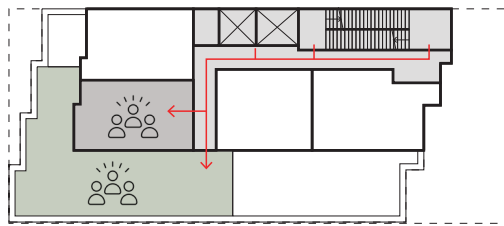



-  Circulation
-  Communal space
-  Outdoor
-  Public

# CASE STUDIES

Floor 7 - 8

The 7th floor has a common room / kitchen. Next to this room there is a communal roof terrace. The apartments on this floor also have their own balcony / terrace. On the 8th floor there are only apartments located.



-  Circulation
-  Communal space
-  Outdoor
-  Public

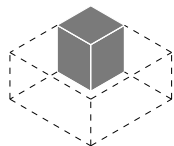
# CASE STUDIES

## Unit 1

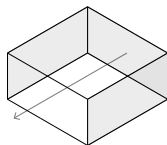
Like all other units in the complex this apartment has a storage element against the ceiling. This is possible because of the relatively high space of almost 3 meters. The large window openings come back in all the other apartments. The apartment has a relatively large open hallway with access to the bathroom and overhead storage. The bed is located in the living room and can be folded into a closet element. The kitchen and the bathroom are connected to each other.

### Dwelling information

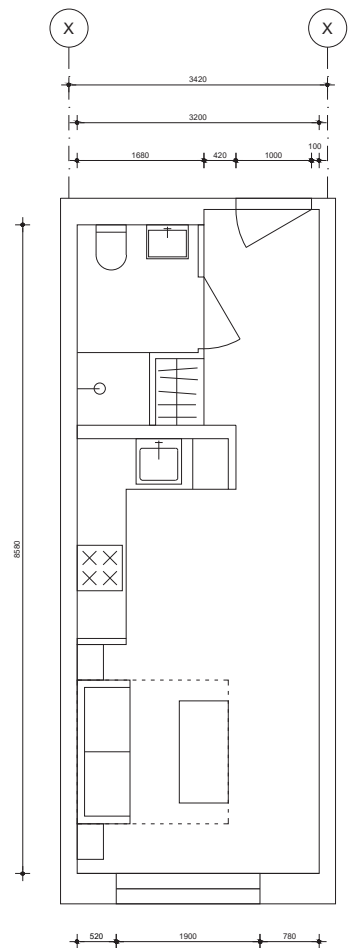
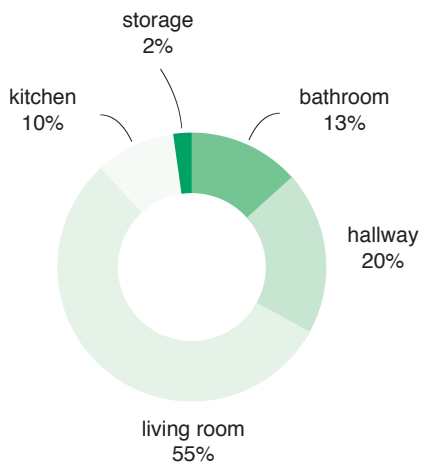
Height	2,95 m
Bathroom	3,6 m <sup>2</sup>
Installations	- m <sup>2</sup>
Hallway	5,3 m <sup>2</sup>
Living room	14,9 m <sup>2</sup>
Kitchen	2,6 m <sup>2</sup>
Bedroom	- m <sup>2</sup>
Storage	0,6 m <sup>2</sup>
Outdoor	- m <sup>2</sup>
<b>Total</b>	<b>27,0 m<sup>2</sup></b>
Facade - wall %	14 - 86



Services in corner



Single orientated



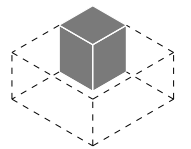
# CASE STUDIES

## Unit 2

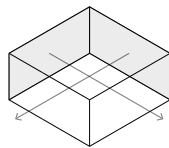
This corner apartment is one of the largest in the complex. Due to the lack of the hallway and separate bedroom, the living room is relatively large. The bathroom is larger than usual and is connected to the kitchen. The apartment also has a large storage space in the corner.

### Dwelling information

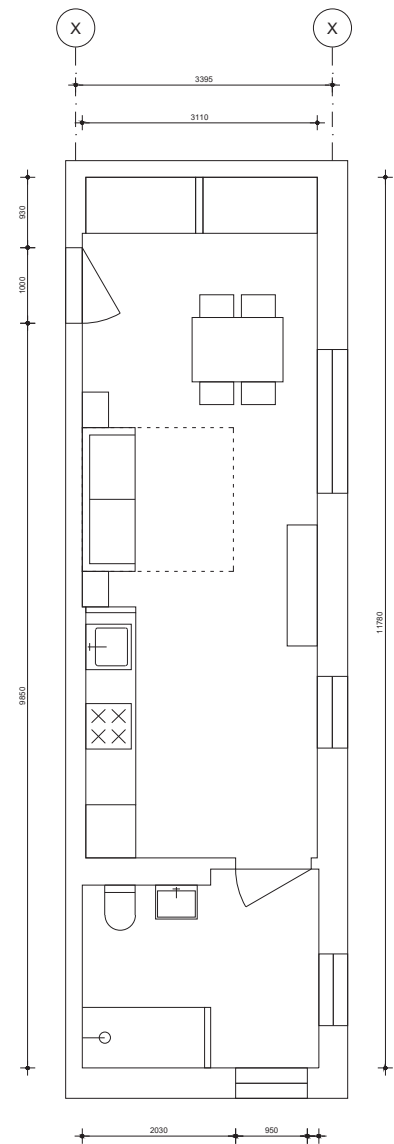
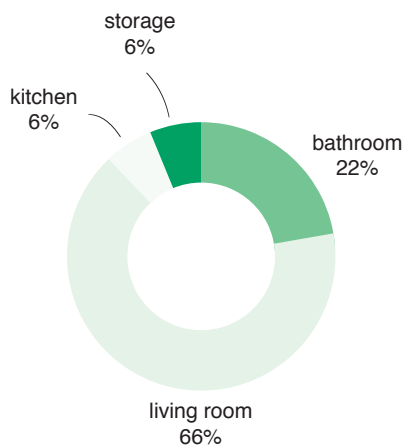
Height	2,95 m
Bathroom	7,9 m <sup>2</sup>
Installations	- m <sup>2</sup>
Hallway	- m <sup>2</sup>
Living room	23,3 m <sup>2</sup>
Kitchen	2,1 m <sup>2</sup>
Bedroom	- m <sup>2</sup>
Storage	2,2 m <sup>2</sup>
Outdoor	- m <sup>2</sup>
<b>Total</b>	<b>35,5 m<sup>2</sup></b>
Facade - wall %	50 - 50



Services in corner



Corner orientated



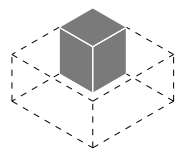
# CASE STUDIES

## Unit 3

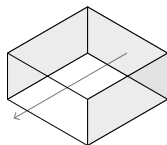
This apartment is very similar to unit 1. However, the entrance of the apartment is located in the middle of the dwelling. Therefore, the hall serves more as storage space and works as a buffer between the living room and bathroom. The bathroom and the kitchen are connected.

### Dwelling information

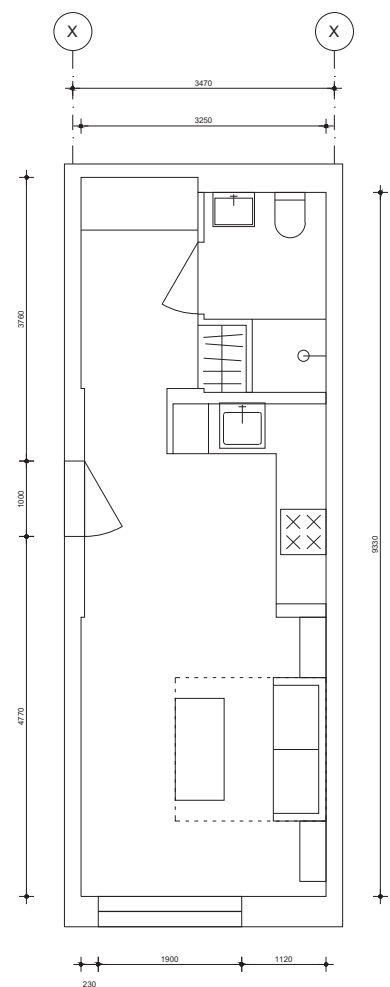
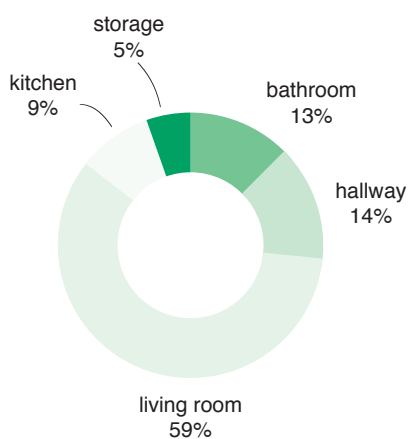
Height	2,95 m
Bathroom	3,7 m <sup>2</sup>
Installations	- m <sup>2</sup>
Hallway	4,2 m <sup>2</sup>
Living room	17,5 m <sup>2</sup>
Kitchen	2,7 m <sup>2</sup>
Bedroom	- m <sup>2</sup>
Storage	1,6 m <sup>2</sup>
Outdoor	- m <sup>2</sup>
<b>Total</b>	<b>29,7 m<sup>2</sup></b>
Facade - wall %	13 - 87



Services in corner



Single orientated





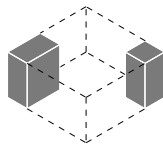
# CASE STUDIES

## Unit 4

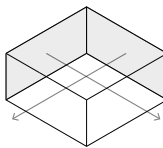
This large corner apartment has a large hallway. This is due to the connection with the kitchen. The hallway provides a separation between the kitchen and the bathroom. Despite the large space, the bed is still part of the living room.

### Dwelling information

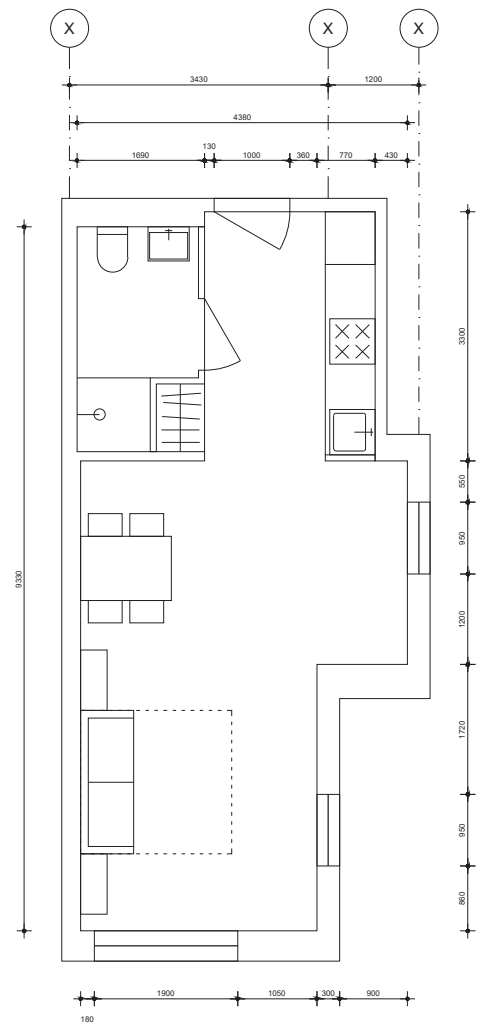
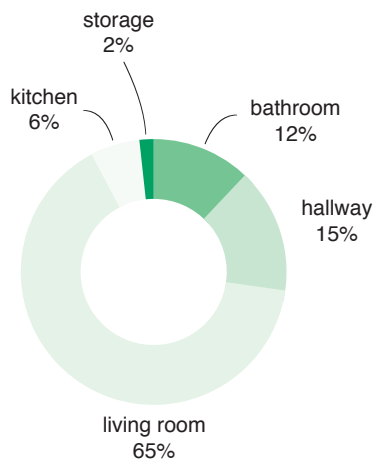
Height	2,95 m
Bathroom	4,2 m <sup>2</sup>
Installations	- m <sup>2</sup>
Hallway	5,3 m <sup>2</sup>
Living room	22,7 m <sup>2</sup>
Kitchen	2,1 m <sup>2</sup>
Bedroom	- m <sup>2</sup>
Storage	0,6 m <sup>2</sup>
Outdoor	- m <sup>2</sup>
<b>Total</b>	<b>34,9 m<sup>2</sup></b>
Facade - wall %	52 - 48



Separated services



Corner orientated



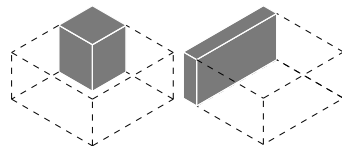
# CASE STUDIES

## Unit 5

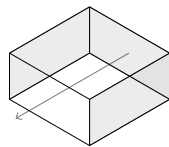
This relatively wide apartment also looks like unit 1. A storage room provides for the separation of the kitchen and the bathroom. On the 7th floor this house also has a balcony.

### Dwelling information

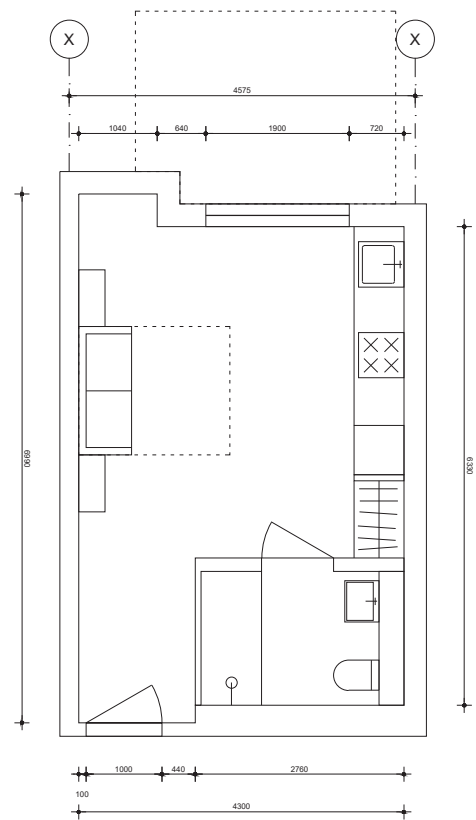
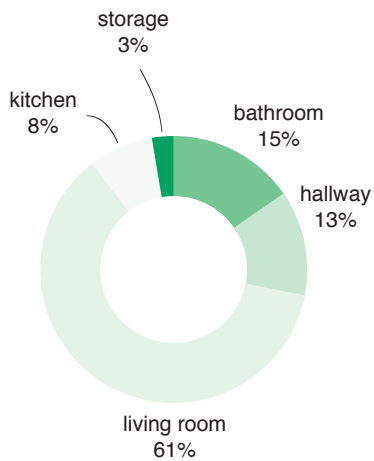
Height	2,95 m
Bathroom	4,1 m <sup>2</sup>
Installations	- m <sup>2</sup>
Hallway	3,4 m <sup>2</sup>
Living room	16,4 m <sup>2</sup>
Kitchen	2,1 m <sup>2</sup>
Bedroom	- m <sup>2</sup>
Storage	0,7 m <sup>2</sup>
Outdoor	- m <sup>2</sup>
<b>Total</b>	<b>26,7 m<sup>2</sup></b>
Facade - wall %	50 - 50



Services centred along wall



Single orientated



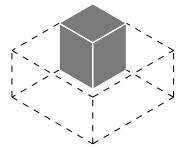
# CASE STUDIES

## Unit 6

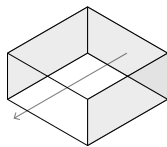
This is as well a apartment with a wide facade. Therefore, the dwelling is also less deep. Due to the lack of a hallway, the living room is larger. In addition, there is also large storage space. The kitchen and the bathroom are connected. On the 7th floor this apartment also has a balcony.

### Dwelling information

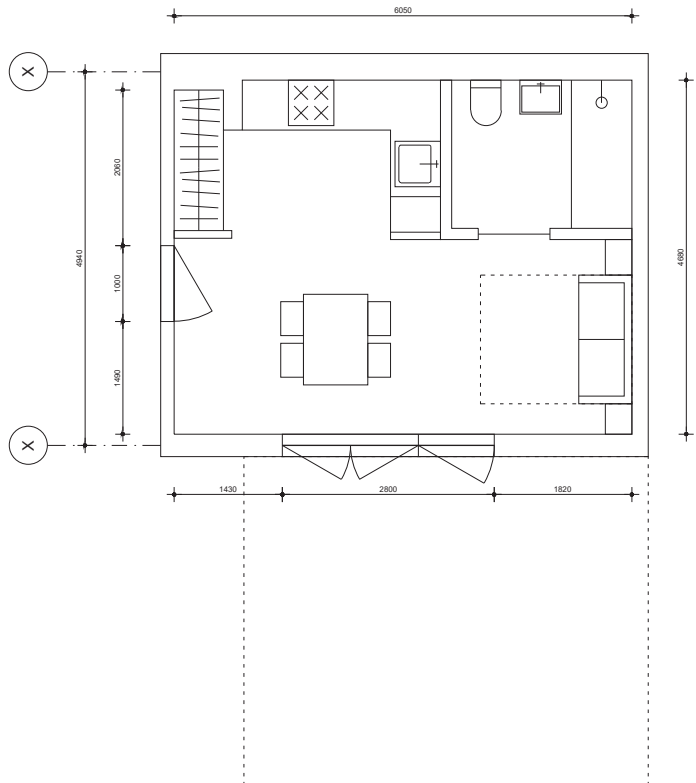
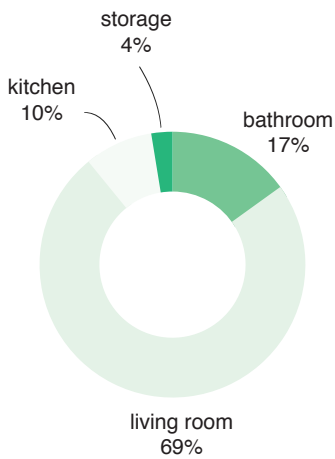
Height	2,95 m
Bathroom	4,7 m <sup>2</sup>
Installations	- m <sup>2</sup>
Hallway	- m <sup>2</sup>
Living room	18,7 m <sup>2</sup>
Kitchen	2,6 m <sup>2</sup>
Bedroom	- m <sup>2</sup>
Storage	1,2 m <sup>2</sup>
Outdoor	- m <sup>2</sup>
<b>Total</b>	<b>27,2 m<sup>2</sup></b>
Facade - wall %	28 - 72



Services in corner



Single orientated



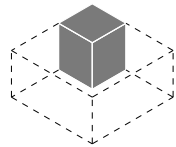
# CASE STUDIES

## Unit 7

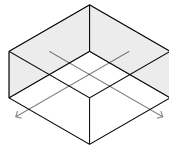
This is also an apartment with a wide facade. Due to the lack of a hall, the living room is larger. The kitchen and the bathroom are connected. On the 7th floor this house also has a separate balcony.

### Dwelling information

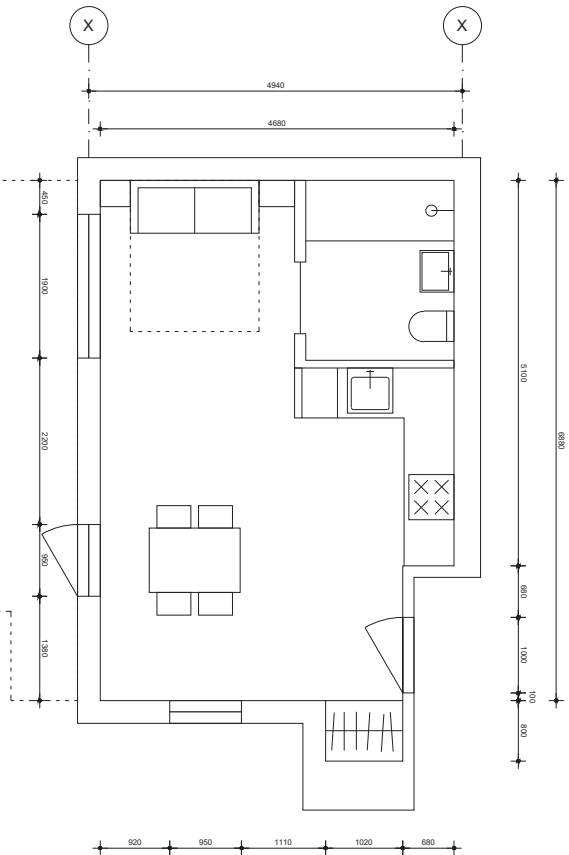
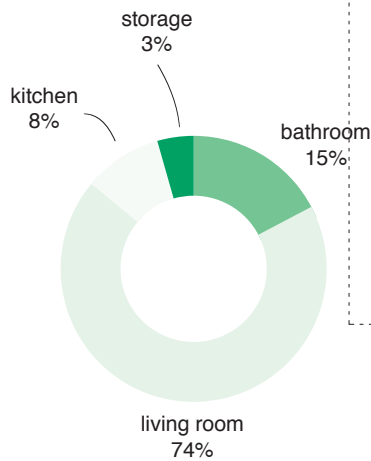
Height	2,95 m
Bathroom	4,7 m <sup>2</sup>
Installations	- m <sup>2</sup>
Hallway	- m <sup>2</sup>
Living room	23,1 m <sup>2</sup>
Kitchen	2,6 m <sup>2</sup>
Bedroom	- m <sup>2</sup>
Storage	0,8 m <sup>2</sup>
Outdoor	- m <sup>2</sup>
<b>Total</b>	<b>31,2 m<sup>2</sup></b>
Facade - wall %	47 - 53



Services in corner



Corner orientated





## CONCLUSION

### Compact apartments

This conclusion summarizes which (architectural) aspects do help to create a compact dwelling for starters. It looks at both the dwelling and to the entire complex. Our results are combined and complemented by additional advises of the Architecture Center of Amsterdam (ARCAM). They developed a number of guidelines for compact apartments.

In history, luxury living concepts and socialist ideas were close together. The sharing of the various facilities such as laundry, kitchen, restaurant, lounge, kindergarten and gym can be found on both sides. In the more luxurious concepts there are more personal services. Most examples are focused on both small households and families. The saving of space is created by the 'standard solution' of folding bed systems. In addition, the integration of essential functions within the house is a common method. Less essential functions are kept outside the dwelling.

Despite the long history, the concept of small living is also a hot item of our time. In the coming years it is expected that amount of one- and two-person households will rise. These people belong to 'the new city dwellers'. This group places less value on private ownership and is willing to share more. This target group primarily considers a good urban location important. Moreover, the compact dwellings are a good answer to the sustainability theme. The high densification has a positive influence on the use of land and energy consumption. This results in a small 'footprint' per person.

#### The complex

##### *Target group*

According to ARCAM in the compact dwelling concept diversity among the residents must be considered to prevent monotonous neighborhoods.<sup>28</sup> For example, the classic system for target group selection on the basis of family composition, must therefore be different. Instead, one must look at the differences in need for social proximity with fellow residents. It is important to look for like-minded people for creating a community.

This is partly determined by the degree of sharing of certain facilities. A distinction is made between collective sharing and anonymous sharing. In collective sharing, facilities are shared by a small group of people. For example one floor. When sharing anonymously facilities are divided among a large group. For example the entire complex. With collective sharing, the focus is on more interaction between neighbors. One finds this more pleasant than the other. Therefore, programs of compact apartments complexes can differ.

28 Architectuurcentrum Amsterdam. (n.d.). Ontwerplab min of meer: microwoning.

##### *Amenities*

The appearance of the entire residential complex is an important aspect in the quality of the individual dwelling, whatever the size is small or large. Less square meters in an individual dwelling can be compensated by shared luxury. This can be accomplished by presence of high-quality collective facilities / amenities that are not present in a normal apartment.

##### *Entrance*

Following this shared luxury also the entrance is important. By creating a large entrance, luxury is again provided for the entire complex. Making a luxury 'address' benefits the individual (small) dwelling.

##### *Personal services*

With compact dwelling the 'third party' is also important. In addition to the management / maintenance by a separate party, personal service is also an important aspect in this residential concept. 'Familiar faces' have a positive effect on the social structure in the complex.

##### *Construction*

The building must have a flexible construction. A load-bearing facade and solid core ensures floors have a flexible layout. Therefore, the floor can accommodate a diversity of housing types and can be adapted to new trends and developments in housing.<sup>29</sup>

##### *Trends*

The compact dwellings must be adaptable to new trends. Today people need less space for parking and bookcases. This is due to technological advances such as iPad and e-readers that work in a space-saving way. In addition, they also state that people spend less time in the living room and that the role of the kitchen in an individual home will may change in the future. This all affects the layout of the house.<sup>30</sup>

#### The Dwelling

##### *Volume - M<sup>3</sup>*

Because the Residents in compact dwellings live on less square meters, other aspects in the home need to be improved in order to preserve the quality of life. People now should have more right to daylight and view. An important aspect is thinking in m<sup>3</sup> instead of m<sup>2</sup>.<sup>31</sup> A higher ceiling not only provides more daylight, but also brings other benefits whit it. Smart interior elements such as horizontal storage close to the ceiling (Carmel Place) and higher sleeping places on top of the storage spaces. Another solution can

29 Ibidem.

30 Ibidem.

31 Ibidem.

# CONCLUSION

## Compact apartments

be sleep and storage in flexible floor elements.

### Single aspect dwelling

In many examples the single aspect principle is used, where there is only one window opening on one side. In this case, the spaces with less daylight demand are located in the back (dark side) of the apartment. These are generally wet rooms, storage, but also the kitchen. Living room and bedroom are on the light side of the dwelling.

### Wet rooms

In most cases, the toilet is located in the bathroom. The kitchen with its water applications water is often located close to the bathroom. Due to the clustering of bathroom and kitchen, the distance from ducts to shafts is reduced. Generally there is no room reserved for a washing machine and dryer. These are often part of the collective spaces.

### Bedroom

In many compact apartments the bed is located in the living room. It can be folded in closet system. For privacy reasons, it is often tried to make a separate bedroom. However, due to the 'single aspect' principle, this room does not have its own window opening. In order to comply this space with the regulations of daylight this space is adjusted to the minimum depth of the bed and open connected to the living room. By using large sliding doors the room can be separated. Also in some cases you have to go via the bedroom to enter the bathroom (De Lofts).

### Privacy

When families live in a compact apartment is advised to give the kids their own bedroom. A modern bedstead could be a solution. Parents can integrate their sleeping place in the living room.<sup>32</sup>

### Case study statistics

Four case studies were discussed during this study. The number is too low to make exclusive statements about compact complexes. However, it gives a good impression what common elements compact complexes have and how they differ.

### Collective space

When the complex gets smaller the amount of collective square meters also becomes smaller. However, in percentage this value rises. North Orleans is an exception here, because there is no collective space except for a small lobby. According to the calculations of the diagrams the average collective space is 5%.

The average amount of m<sup>2</sup> per dwelling: XS Deluxe = 47 m<sup>2</sup>, De Lofts = 35 m<sup>2</sup>, North Orleans = 33 m<sup>2</sup> and Carmel Place = 37 m<sup>2</sup>. All including outdoor space. The total average m<sup>2</sup> per dwelling is: 38 m<sup>2</sup>.

The average amount of m<sup>2</sup> of common space per dwelling: XS Deluxe = 2.4 m<sup>2</sup>, De Lofts = 2.5 m<sup>2</sup>, North Orleans = 0.3 m<sup>2</sup> and Carmel Place = 5.8 m<sup>2</sup>. The total average m<sup>2</sup> per dwelling is: 2.8 m<sup>2</sup>.

### Access

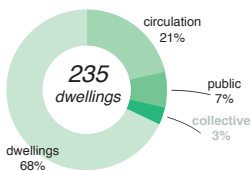
Especially gallery and corridor principle are often used. Ground-based homes with a garden do occur with XS Deluxe. Portiek principle is not applied in any of the case studies.

### Outdoor space

In most examples there is no private outdoor spaces. The outdoor spaces are often a collective solution. Beside to this collective space XS Deluxe has several dwellings with their own outdoor space. North Orleans compensates for the lack of collective space with a private balcony for each apartment.

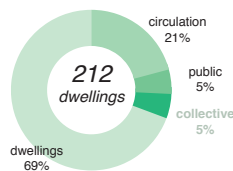
### XS Deluxe - NL

Dwellings	11.024m <sup>2</sup>
Collective	560 m <sup>2</sup>
Public	1.170 m <sup>2</sup>
Circulation	3.470 m <sup>2</sup>



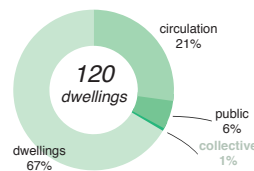
### De Lofts - NL

Dwellings	7.317 m <sup>2</sup>
Collective	520 m <sup>2</sup>
Public	519 m <sup>2</sup>
Circulation	2.201 m <sup>2</sup>



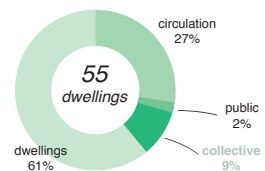
### North Orleans - NL

Dwellings	3.940 m <sup>2</sup>
Collective	32 m <sup>2</sup>
Public	340 m <sup>2</sup>
Circulation	1.610 m <sup>2</sup>



### Carmel Place - US

Dwellings	2.057 m <sup>2</sup>
Collective	318 m <sup>2</sup>
Public	70 m <sup>2</sup>
Circulation	927 m <sup>2</sup>



32 Ibidem.

## Conclusion

### Compact apartments

#### Structure width

In contrast to ARCAM's advice, the case studies do not use the core in with a load-bearing facade combination. In general, narrow prefab channel constructions are used. Short floor spans that keep the price low. These narrow sizes vary between 3.4 and 3.7 meters. There are exceptions with larger structure width. For example, De Lofts uses a standard size of 5.7 and 6.0 meters. This value is also found in several cases in the design of XS Deluxe.

#### Heights

The advice is to think in volumes, but in the case studies it has hardly been applied. It is done to in limited way at Carmel Place. The high ceiling of 3 meters ensures high storage places. Nevertheless, in all cases large window openings have been used.

#### Dwelling services

The positioning of the services within the dwellings is very variable. Both between the complexes as in the complexes themselves. Two variants that are most common are: 'Services in corner' and 'Separated services'.

#### The hallway

Inside the dwelling, the hallway plays an important role. This often works as a kind of buffer zone between the bathroom (with toilet) and the rest of the apartment. However, this area takes a lot of space. It varies between 4% and 26% of the total dwelling space. In many cases, the hallway is not included in the design.

#### Kitchen, storage and bathroom

These values are stable. With the kitchen around 4% and the storage around 4%. The bathroom is on average 11% of the total dwelling space.

#### Amenities

The amenities are part of the compact apartment concept and partly determine the people who will live there. On the basis of the four case studies, an overview has been made of the possible amenities and in which groups they can be accommodated.

#### Public amenities



Restaurant



Commercial space



Gym / Yoga / Cross-fit



Barber



Tanning salon

#### Collective amenities



Parking storage



Communal kitchen



Laundry



Communal living room, game room, terrace, storage



Parking car



Communal outdoor space



Study place









# Urban food

## INTRODUCTION

### Food

The interest and awareness on food is growing, especially in urban environments. This growing interest is not without a reason. The current food system is not sustainable for the future. A drastic change in the way we feed ourselves and city is needed. In order to stress this need an improvement of the awareness on this topic is crucial. Since more and more people are moving to cities, the pressure on the food system in cities is increasing. It is remarkable that there are very few examples of architectural or urban projects that seek for solutions for the unsustainable food system we are currently using. In this chapter there is searched for a way how to incorporate food initiatives in architecture in order to increase the awareness on the topic.

By looking into food in the city urban agriculture is an obvious topic to look into. The interest in growing your own

food is increasing. Waiting lists for allotment gardens are growing and people grow there on herbs or vegetables in their garden or on their balcony or rooftop.

The case studies that are researched cover all the possible food related initiatives in a city that are relevant to contribute to the improvement of a food aware environment.

With smart small apartment complexes it is known that the target group fits the collective and public functions. The target group is starters, but to be more specific, starters that have a specific interest in food. By connecting the target group and the food theme, a collective home for people with the same interest is created.

## RELEVANCE

### Food in the city

As western citizens it seems so obvious that we can buy every kind of food we want, especially in urban areas. A daily visit to the supermarket is normal for all of us, but most of us are not aware of the effort it takes to get the most exotic fruits into our shopping basket. The growing population makes it even more difficult and the world is having a hard time feeding everyone.

Before the industrialization cities were mostly founded on tactical places, close to rivers, sea or fertile soil. The inner-city was highly influenced by the production and trade of food. As Carolyn Steel wrote in *Hungry City*: "Food shapes cities, and through them, it molds us - along with the countryside that feeds us".<sup>33</sup> In Amsterdam the influence of the food system in the city center is still recognizable in the street names and gables. Streets like Kalverstraat, Brouwersgracht, Karnemelksteeg, Warmoesstraat and Zoutsteeg refer to the goods that where either produced, transported or traded on that specific location. Most of the fruits, vegetables and cattle was held just outside the city, and could easily transported into town over water or land.

After the industrialization in the second half of the eighteenth century a lot changed in the food system. The production of iron made it possible to make agricultural machinery. Due to this development less people were needed but larger quantities were produced. Rural workers headed to the cities with an increasing number of city residents as a result. According to Steel, the downside of this was that "The gap between the feeder and the fed was widening, and it was about to get a whole lot wider."<sup>34</sup> Next to agricultural machinery the industrialization also lead to the improvement of the connection between cities and its rural backyards. Trains made it possible to transport fresh food from rural areas directly en fast towards cities. Later also soil fertilizers and pesticides played a big role in the mass production of food, although it lead to quite some problems as well.

In Amsterdam food was until the twentieth century distributed from several markets throughout the city. These trading points caused a lot of nuisance and to centralize the trade in food the Centrale Markt(Food Centre Amsterdam) was build in 1934 at Jan van Galenstraat in the west-side of Amsterdam.

The growth of population due to industrialization and globalization resulted in an explosive expansion of the import and export of agricultural goods. According to a recent article in National Geographic the Netherlands has the second biggest export of agricultural goods, just after

the United States. Obviously, that is very remarkable for such a small country.

Although our good position in agricultural business, the current food system is not a sustainable solution for the future. The world is having difficulties feeding our population, food production has a huge environmental impact due to the high CO2 emission, public health is in danger because of production methods and the use of pesticides, the infrastructure to transport the food is polluting, and so on. Furthermore, the food we eat is delivered 'just in time' from places all over the world. This 'just in time' delivery of our daily needs can not withstand a sudden crisis. Next to that, the scale of our food supply systems is very vulnerable, experts even speak about food related terrorism.<sup>35</sup> The awareness of our unsustainable way of feeding ourselves is growing but it is complicated to change the system on a bigger scale.

In a city as Amsterdam supermarkets have taken over the sale of food since the 80's and 90's. This development is one of the reasons for loosing the relation and contact with our food, what makes it harder to feel responsible for it. "... food is not embedded in our culture. We only lavish time and money on it when we are 'treating ourselves', not as part of a daily routine.", is how Carolyn Steel describes it.<sup>36</sup> Big companies dominate the global food trade, what makes it a challenge to improve the food system. 30 companies handle 30 % of all the global food trade.<sup>37</sup>

Currently the awareness on food and its systems is growing. Allotments in and around the city are very popular, the amount of farmers markets is growing, food and urban agricultural initiatives work on the awareness and it is a much-discussed topic, especially in cities.

33 Steel, C. (2008). *Hungry City: How Food Shaped Our Lives*.

34 Steel, C. (2008). *Hungry City: How Food Shaped Our Lives*.

35 Steel, C. (2008). *Hungry City: How Food Shaped Our Lives*.

36 Steel, C. (2008). *Hungry City: How Food Shaped Our Lives*.

37 Action Aid International in Steel, C. (2008). *Hungry City: How Food Shaped Our Lives*.



## URBAN AGRICULTURE

What is urban agriculture?

Urban agriculture is defined as growing vegetables, fruits and herbs and raising animals in cities. It is a process that is accompanied by many other additional activities such as distributing and processing food, collecting and reusing food waste but also rainwater. Next to that, complementary activities like educating, organizing and employing local residents is often seen in urban agriculture activities. Urban agriculture is on small and big scale integrated in the city. On a small scale it is integrated in individual communities and neighborhoods, while on the bigger scale in the ways that cities function and are managed, including municipal policies, plans and budgets.<sup>38</sup>

Urban agriculture is often about much more than food. Firstly, the city gardens and farms beautify neighborhoods, provide open space and serve as a place for people to socialize. Furthermore, it helps the water management of the city as permeable green spaces. Next to that, it can learn people about ecology, food systems and managing farmers markets. Often it is a vehicle for community organizing and social justice campaigns.<sup>39</sup>

38 Design Trust & Added Value (2012). Five Borough Farm: Seeding the future of urban agriculture in New York City.

39 Design Trust & Added Value (2012). Five Borough Farm: Seeding the future of urban agriculture in New York City.



*Seeds to Feed rooftop farm (designtrust.org)*

# URBAN AGRICULTURE

## Types

Design Trust defined four categories of urban agriculture: institutional farms, commercial farms, community gardens and community farms.<sup>40</sup> The characteristics and common elements of the four types are described below.

### Institutional farms and gardens

Institutional farms and gardens are affiliated with an institution such as a school, housing development, prison, etc. It is very common to collaborate with schools, in order to educate students about food and cooking. In general the goal of institutional farms is not food production but achievements of urban agriculture like education, awareness and health.

### Commercial farms

In general, the main goal of commercial farms is maximizing crop performance in order to achieve profitability. This is in contrast with community farms, which have other interests. Nevertheless, often commercial farmers share many of the goals of the community around urban agriculture, such as capturing storm water, improving air quality and creating awareness about healthy eating. Just like community gardens and farms, commercial gardens partly rely on volunteer labor and donated materials.

40 Design Trust & Added Value (2012). Five Borough Farm: Seeding the future of urban agriculture in New York City.

### Community farms

A community farm is a farm operated by a group of volunteers or by a nonprofit organization. The engagement with the surrounding community is integrated in the vision of this type of farm.

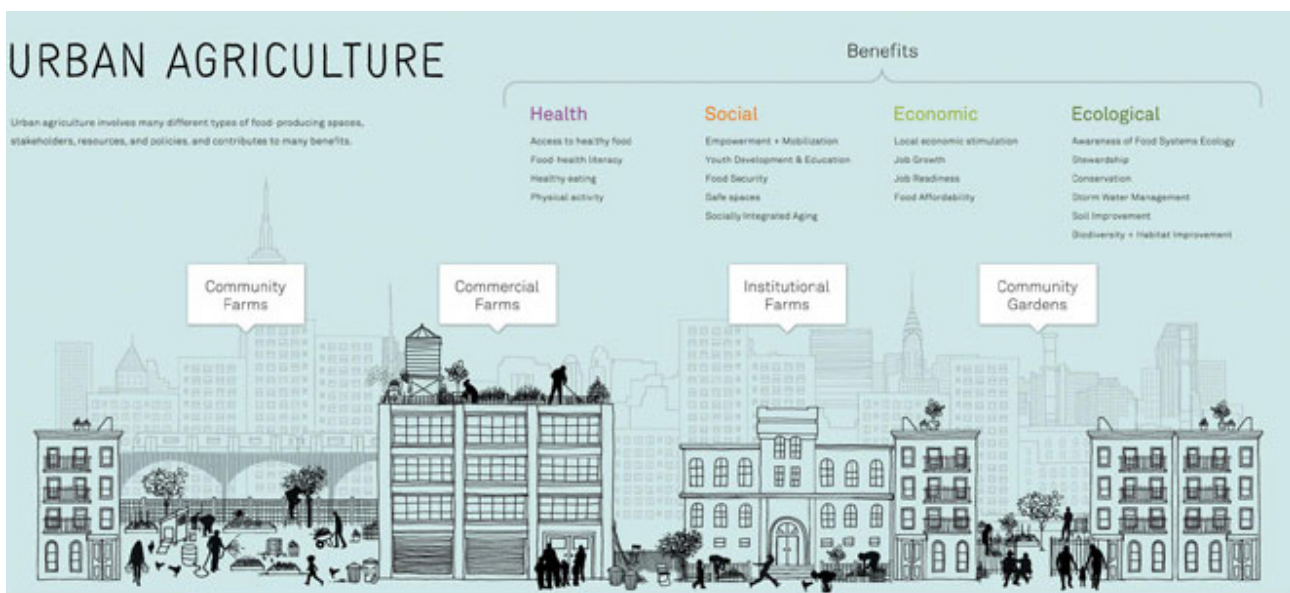
Obviously, growing food is part of a community farm's operation. However, the focus is more on community development and social programs like youth leadership training and school education.

### Community gardens

This type of urban agriculture provides space for growing vegetables, growing flowers but also for gathering, socializing and passive recreation.

Typically, community gardens are run by groups of volunteers, usually from the surrounding neighborhood. They maintain individual plots of communal growing spaces.<sup>41</sup>

41 Design Trust & Added Value (2012). Five Borough Farm: Seeding the future of urban agriculture in New York City.



Urban agriculture types (fiveboroughfarm.net)

# URBAN AGRICULTURE

## Activities

The community of urban agriculture is not solely focused on producing food. Growing food is important but often food production is described as a means to other goals as well. This can be for instance educational, social or labor related activities.

The activities that take place in urban agricultural initiatives can be organized under four categories: health, social, economic and ecological. Below, some activities are shown.<sup>42</sup>

### Health

Several strategies are used to improve the health of participants of urban agriculture: educating participants about the relation between healthy food and personal health, motivating people to increase their consumption of fruits and vegetables, use gardening as a form of physical activity and providing access to healthy food.

- Distributing food
- Community-Supported Agriculture (CSA) (membership, receiving food weekly)
- Cooking and nutrition classes

### Social

Farms and gardens in the city offer spaces for people to meet, beautify the neighborhood and join social or political focused campaigns.

- Clearing and transforming vacant land
- Social gathering spaces
- Intergenerational interaction
- Community-based research and organizing
- Food justice/social justice education
- Women-focused programs

### Economics

Farms and gardens often organize farmers markets where products are sold from the local urban farm and from regional farmers.

- Selling food
- Youth empowerment and job training
- Employment

### Ecological

It is common to capture rainwater and use it for watering the crops. Also the food is reused by composting it.

- Rainwater harvesting
- Composting
- Soil remediation
- Environmental education

<sup>42</sup> Design Trust & Added Value (2012). Five Borough Farm: Seeding the future of urban agriculture in New York City.

Many studies have shown links between the urban agriculture activities across the top row (such as cooking and nutrition classes, rainwater harvesting, farmers markets) and the health, social, economic, and ecological benefits on the left hand column (such as health eating, stormwater management, and social connections).

 Evidence-based links

## Benefits

### Health

- Access to healthy food
- Food-health literacy
- Healthy eating
- Physical activity

### Social

- Empowerment & mobilization
- Youth development & education
- Food security
- Safe spaces
- Socially integrated aging

### Economic

- Local economic stimulation
- Job growth
- Job readiness
- Food affordability

### Ecological

- Awareness of food systems ecology
- Stewardship
- Conservation
- Storm water management
- Soil improvement
- Biodiversity & habitat improvement

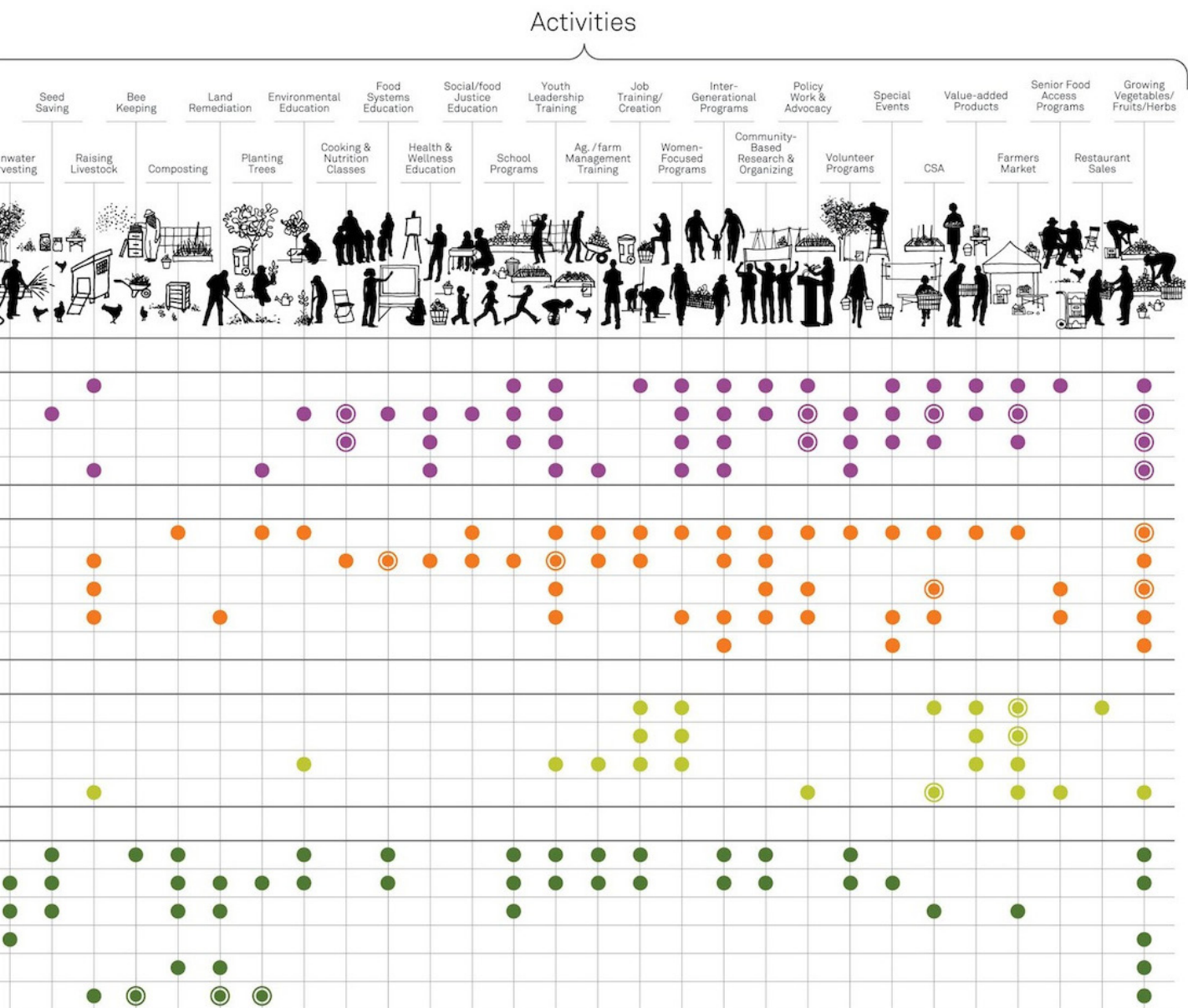




# URBAN AGRICULTURE

## Metrics framework

The metrics framework shows how all the activities that can take place in urban agricultural farms and gardens are related to specific benefits, categorized in health, social, economics and ecological.



Metrics Framework. (Design Trust & Added Value (2012). Five Borough Farm: Seeding the future of urban agriculture in New York City.)

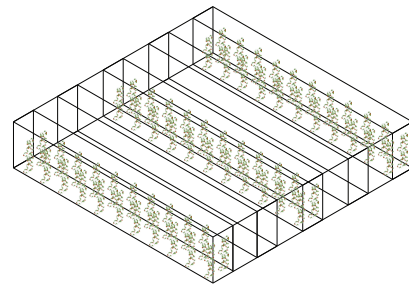
# URBAN AGRICULTURE

## Types

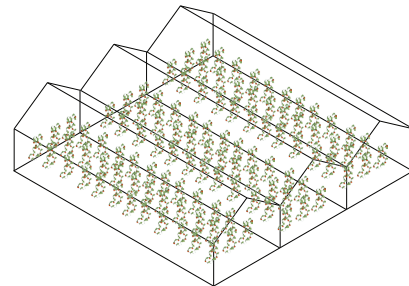
In terms of the production of food there are a couple of types suitable for the design at Groenmarkt. Roughly, there is a division between high-tech and low-tech production. From the option shown only the vertical farm type is a high-tech option.

Each option has its own spatial qualities and goals. The types range from public to not public accessible farms.

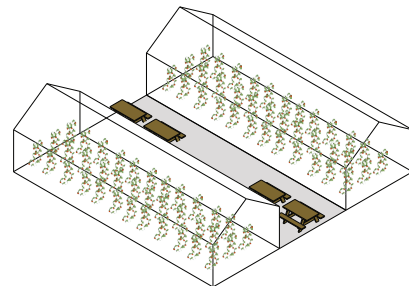
- 1a. Production building (vertical farm)  
Closed space with main goal the production of food. Mostly not public accessible.
- 1b. Production greenhouse  
Greenhouse with main goal the production of food. Mostly not public accessible.
2. Orangery  
Greenhouse with production of food as main goal. Public accessible and with other activities.
3. Oases/park  
Green semi-public space. Designed as a contrast with the city, often used to relax. Mostly for welcoming visitors.
4. Campus  
An area with a wide variety of products and activities like education, innovation, restaurants, do it yourself and markets.<sup>43</sup>



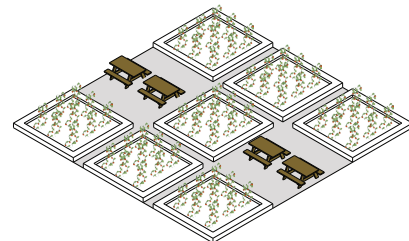
1a. Production building (vertical farm)



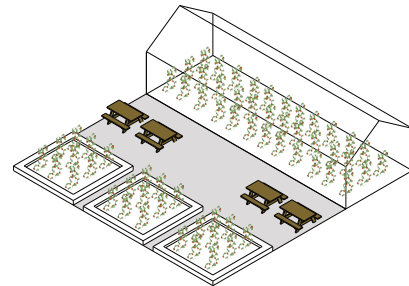
1b. Production greenhouse



2. Orangery



3. Oases/park



4. Campus

<sup>43</sup> Landbouw, G. D. S. (2013). Stadsboeren in Nederland: Professionalisering Van De Stadsgerichte Landbouw. Rotterdam: Van Bergen Kopla Architecten, Wageningen UR/LEI, De Volharding. Ministerie van Economische Zaken, Ministerie van Infrastructuur en Milieu, Breda, Priva.



## CASE STUDIES

### Introduction

During the research on urban food initiatives a lack of architectural projects with integrated urban food/agricultural systems was noticed. It is decided to study all kind of case studies that can be integrated in an architectural scheme.

A selection of 15 projects is studied. Each project is valued on a set of key dynamics. This rating system helps to define the impact of the projects. Basically all the dynamics contribute to the improving of awareness on the subject of food in the city. By defining the key dynamics of the projects it is easier to decide on what functions are suitable for a starter complex with compact apartments on the project location Groenmarkt.

The 15 selected projects are categorized in the following categories; (super)market, rooftop farm, restaurant, workshops, vertical farming, waste management and shared/communal kitchens. Several projects belong to one or more categories.

## CASE STUDIES

### Key dynamics<sup>44</sup>



#### Social

The project creates or strengthens communities and social ties, and/or supports communication and cohesion.



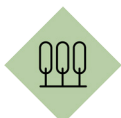
#### Economics

The project creates jobs, supports local economic activity and/or promotes a viable business model.



#### Education

The project teaches food skills and promotes awareness about food, health and the environment.



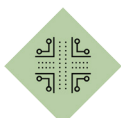
#### Environment

The activities are sustainable or beneficial to the environment in terms of nature, waste, energy, soil, water and air.



#### Health

The project provides affordable, nutritious, fresh and healthy food and supports a positive public health agenda.



#### Infrastructure

The project contributes to the food infrastructure in terms of growing sites, transportation, community platforms and/or planning.



#### Livability

The project creates interactive spaces, helps to reduce antisocial behavior and provides urban amenities from cultural events and cafés to attractive and edible green space.

44 Miazzo, F., & Minkjan, M. (Eds.). (2013). Farming the City: Food as a Tool for Today's Urbanisation. CITIES trancity-valiz.

## CASE STUDIES

The Farmery, Durham, US  
Supermarket, vertical farming

The Farmery is an urban farm and market built from shipping containers and standard greenhouse components. The lower level serves as a market selling produce and the center structure is used for growing.

The farm produces mushrooms, herbs, strawberries, lettuces and greens. The Farmery raises the value of crops through an incredible retail experience. Customers are surrounded with growing food, and they can buying the freshest possible produce.

The Farmery is a completely new approach to farming and food retailing, one that looks for symbiosis within the entire system rather than for the optimization of individual components. It's a growing an retailing system which is designed to provide locally grown food in urban neighborhoods. It is a completely new way to shop for food that hasn't traveled thousands of kilometers until your plate. The entire structure is used to grow food what makes that customers are surrounded by the sights, smells and sounds of their food growing as they are making their purchase.<sup>45</sup>



45 The Farmery, 2017



Terrace, the Farmery ([bitesofbullcity.com](http://bitesofbullcity.com))





indoor farming, the Farmery ([thefarmery.com](http://thefarmery.com))



## CASE STUDIES

The Peoples Supermarket, London, UK  
Supermarket

The People's Supermarket vision is to create a commercially sustainable, social enterprise that achieves its growth and profitability targets whilst operating within values based on community development and cohesion. Their aim is to provide an alternative food buying network, by connecting an urban community with the local farmer community.

The supermarket is a sustainable cooperative that responds to the needs of the local community and provides healthy, local food for reasonable prices.<sup>46</sup>



46 The Peoples Supermarket, 2017



Employee ([thepeoplesupermarket.com](http://thepeoplesupermarket.com))





Facade ([thepeoplessupermarket.com](http://thepeoplessupermarket.com))



Interior ([whatsoninlondon.co.uk](http://whatsoninlondon.co.uk))



## CASE STUDIES

### Zuidpark rooftop farming, The Netherlands, Amsterdam Rooftop farm

Zuidpark Urban Farming Rooftop is located on the roof of a modernist office building that has recently been renovated to offer flexible and mobile working facilities.

The rooftop has various functions: it serves as the office park, where people can meet, walk and eat lunch. Furthermore it is a cultivating space where almost 70 different fruits, vegetables and herbs are grown.

The food is harvested by cooks who prepare food at one of the building's lunch spaces and also by office workers who are willing to take fresh produce at home for dinner.

Zuidpark shows that urban farming is as much for adding amenities, as well as social and economic value, to an office building as it is about cultivation. A non-traditional office environment has been created, not only because the building fosters sustainable entrepreneurship and provides flexible workspace, but also because it incorporates the rooftop farm into its operational concept, providing welcome additional space in an increasingly dense urban environment.<sup>47</sup>



47 Zuid Park: Stay Connected, 2017



Roof top (zinco-greenroof.com)





Roof top ([heren2.nl](http://heren2.nl))



Roof top ([groenbovenalles.nl](http://groenbovenalles.nl))



## CASE STUDIES

From Your Own City, The Netherlands, Rotterdam  
Restaurant, garden

From Your Own City is a commercial urban food growing and preparation concept that aims at a complete vertical integration of the food chain. Everything grown by From Your Own City, can be bought at its shop, and a part of the produce is also used in its restaurant, along with a part of regional produce.

The restaurant's menu varies daily, depending on the ingredients harvested at the garden. Fruit, vegetables and herbs are grown, chickens scratch freely around the site and fish is growing in an aquaponic system.

From Your Own City is relevant for a new urban development paradigm because it integrates as many aspects of the food system as possible into a local production and consumption cycle. Commercially this is beneficial since there are few intermediates.

The collective is looking to deploy its professional food production chain to less connected urban location throughout the Netherlands, creating local food hubs in various cities.<sup>48</sup>



48 Uit je eigen stad, 2017



Diner ([uitjeeigenstad.nl](http://uitjeeigenstad.nl))





Restaurant ([mucc.nl](http://mucc.nl))



Vegetable garden ([hofvandelfland.nl](http://hofvandelfland.nl))



## CASE STUDIES

Incredible Edible, Todmorden, UK  
Workshops, garden

Incredible Edible in Todmorden, UK, is a group of passionate people working together for a world where everyone is responsible for the future well-being of people and planet. By working together, using the common language of food, they can cross cultural, social and economic barriers to create a more sustainable community.

The community aims to provide the neighborhood with fresh and locally grown food. They also promote the education about food to schools. Incredible Edible supports local businesses, and through apprentice schemes, helps to train the food producers of the future.

The last couple of years have thrown up many initiatives that can bring people closer to their food and their production.

The community's suggestions are:

- Make growing a performance indicator for well-being across all public services
- Insist that all new houses have ready-to-grow spaces
- Encourage all social landlords to allocate space for growing
- Create a charter for truly local markets - support local producers and farmers
- Make sure public bodies like schools and health authorities have producing local food as a priority
- Invest in food skills for the future<sup>49</sup>

49 Incredible Edible, 2017



Food to share ([ourlocality.com](http://ourlocality.com))



Map (treehugger.com)



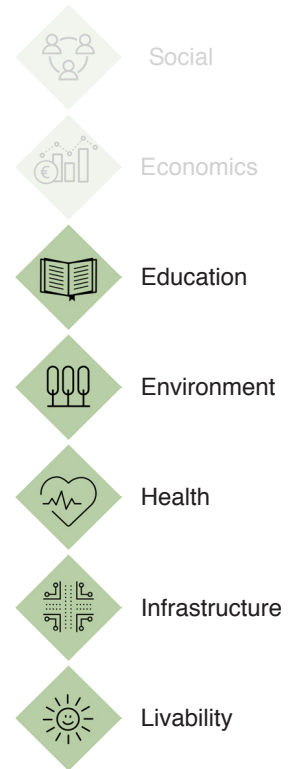
## CASE STUDIES

HK Farm, Hong Kong  
Rooftop farm

HK Farm is an organization founded by Hong Kong urban farmers, artists and designers. It aims to communicate the value of rooftop farming and benefits of local produced food. HK Farm grows local food and designs products and services related to urban agriculture.

The Farm grows seasonally and practices organic farming methods. As part of creative, community and educational work it offers school tours, collaborates with other rooftop farms, and runs plant-making workshops and exhibitions. From a farming perspective, Hong Kong is producing less and less food every year. For example in 1980 20% of the vegetables that were consumed in Hong Kong, were also grown in Hong Kong. In 2012 this figure has significantly reduced to only 2,3%. It has been argued by some rural farmers that the government is not supportive of local agriculture in its policy.

As urban farmers, HK Farm is aware of such socio-cultural and environmental issues affecting Hong Kong and its population and aims to address them in its organic urban farming practices. HK Farm promotes such organic practices in its creative workshops, school tours, exhibitions and with the community around the rooftop.<sup>50</sup>



50 HK Farm, 2017



Vision ([hkfarm.org](http://hkfarm.org))





Farmer ([hkfarm.org](http://hkfarm.org))



Rooftop ([hkfarm.org](http://hkfarm.org))

## CASE STUDIES

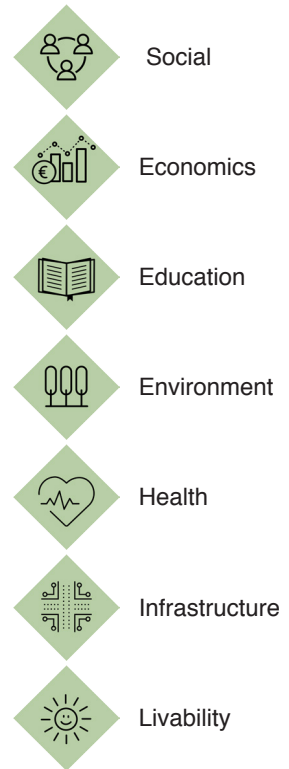
Urban Farmers, The Hague, The Netherlands  
Vertical farm, workshops

Urban Farmers De Schilde is a greenhouse built on top of an existing building. The founders believe that it's more convenient, healthier, fresher and sustainable to grow and breed food where it is eaten; in cities. Their goal is to empower the farmers and engage the people.

To grow vegetables and fish they use an aquaponics system. It combines vegetable and fish production: nutrients rich waste water from fish production are recycled as fertilizer for vegetables, and plants can purify the water that will be reused for fish production. Aquaponics can save a huge amount of water compared to other systems.

Urban Farmers organize tours through their farm and offers cooking workshop with fresh harvested food. Food related events are organized on the rooftop and the rooftop can be rented as event area.

On Wednesdays and Fridays foods can be bought at their rooftop market.<sup>51</sup>



51 Urban Farmers. 2017



Rooftop greenhouse (*museon.nl*)





Interior ([startupthehague.nl](http://startupthehague.nl))



Greenhouse ([duurzaamdenhaag.nl](http://duurzaamdenhaag.nl))



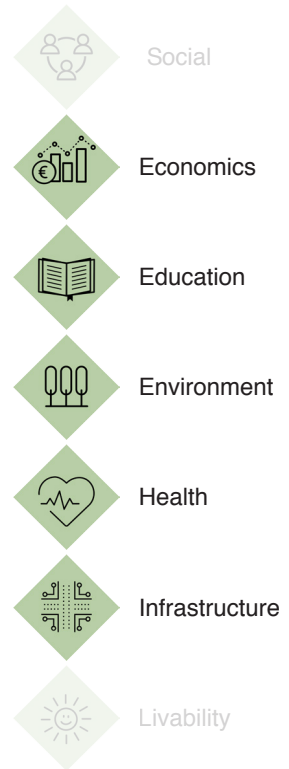
## CASE STUDIES

AeroFarms, Amsterdam, The Netherlands  
Vertical farming

AeroFarms mission is to transform the traditional agriculture by building and designing environmentally responsible farms to enable local production at scale and nourish our communities with safe, nutritious and good tasting food. By building next to major distribution routes and near population centers, traditional supply chains are disrupted.

The Aeroponics system that is used mist the roots of the crops with nutrients, water and oxygen. Aeroponics is a closed system and uses 95% less water than field farming and 40% less than hydroponics.

Students of the Phillips Academy Charter School harvest their own vegetables from an AeroFarms unit located in their dining hall. This integration of vertical farming into education improves the connection with food and the awareness of why food matters.<sup>52</sup>



52 AeroFarms, 2017



Vertical farming ([foundationfar.org](http://foundationfar.org))



Aeroponics ([aerofarms.com](http://aerofarms.com))



Aeroponics ([ntd.tv](http://ntd.tv))



## CASE STUDIES

Freight Farms  
Vertical farming

Freight Farms developed the Leavy Green Machine, a vertical farming system build in a 40 ft container. LED's provide artificial sunlight and a closed hydroponic system supplies the crops with nutrients.

With a hydroponic system plants are growing in water that contains nutrients instead of soil containing nutrients. For growing all the crops in one container only 20 liters water a day is needed.

The controlled climate makes it possible to grow big quantities 365 days a year. Crops that are suitable for growing in a LGM are lettuce, leafy greens, herbs, roots and flowers.

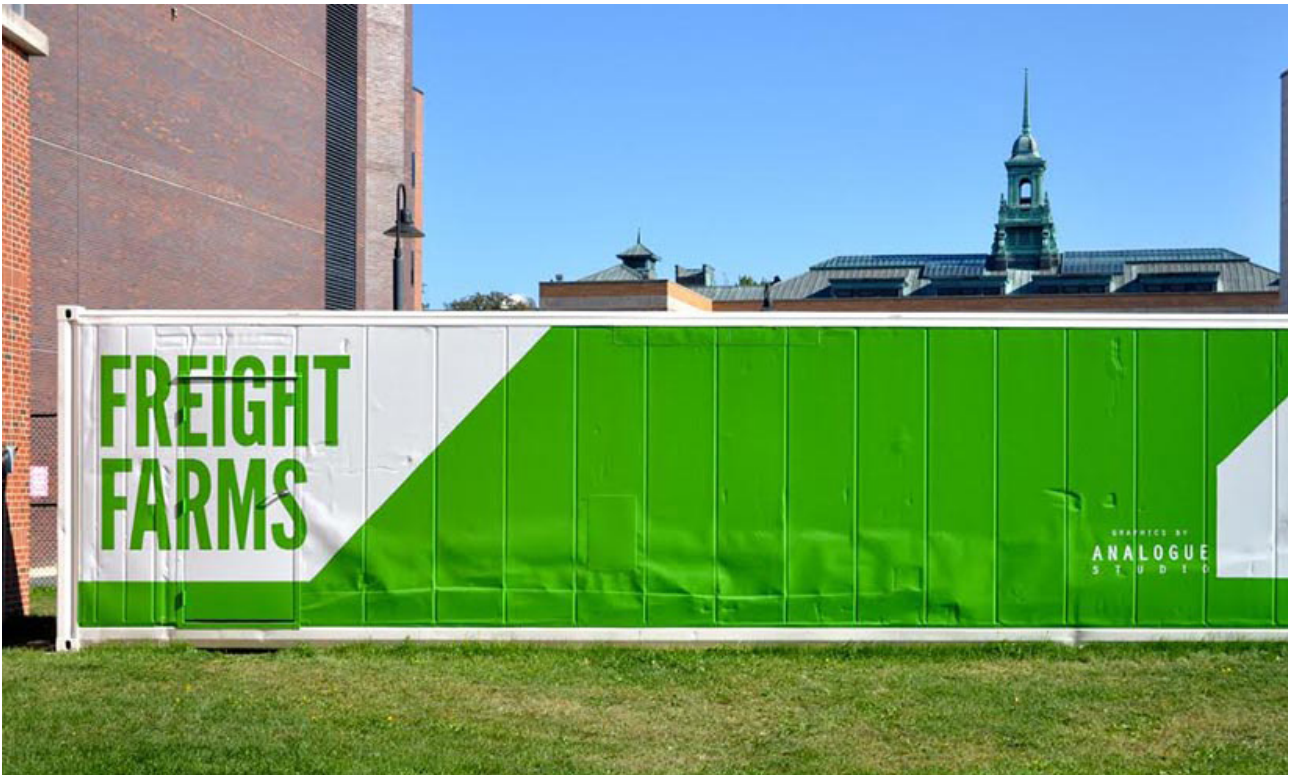
The system is really about high intensity farming and not about social or educational improvement.<sup>53</sup>



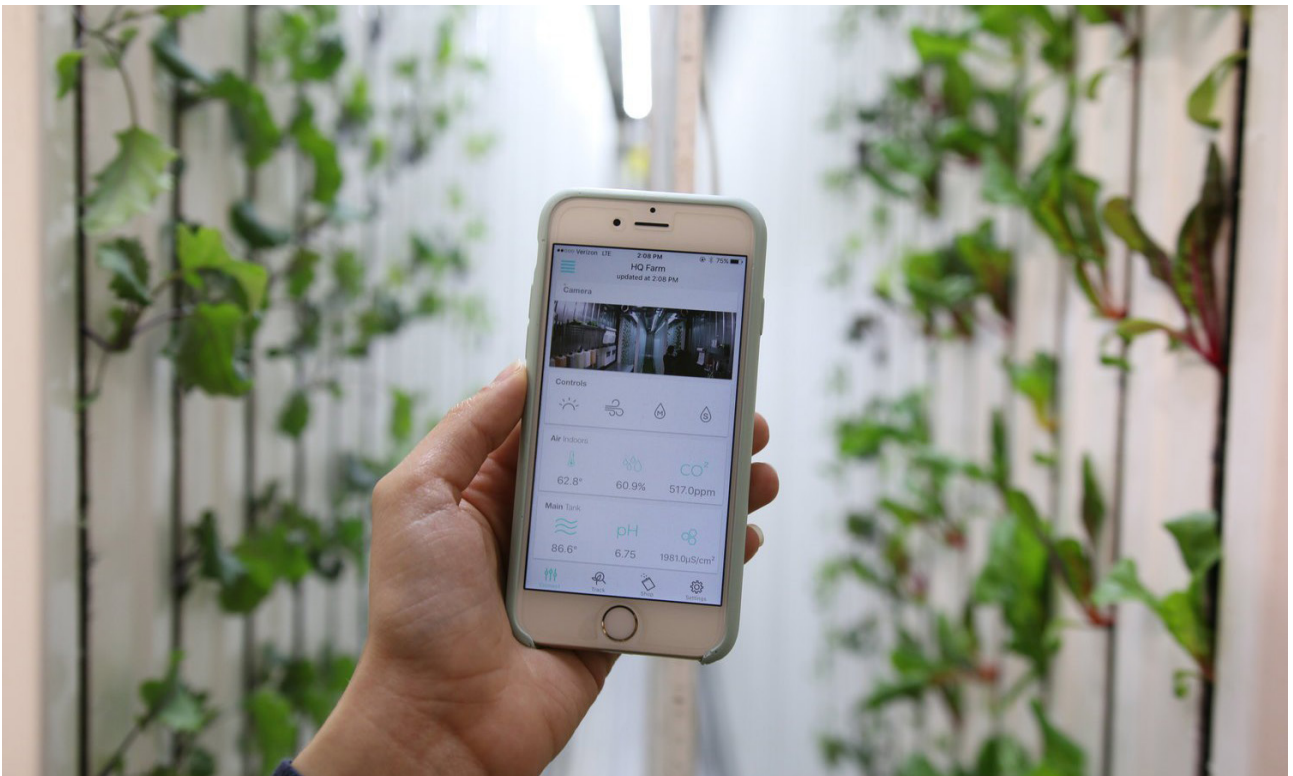
53 Freight Farms, 2017



Hydroponics ([freightfarms.com](http://freightfarms.com))



Freight Farms container ([wbur.org](http://wbur.org))



App ([freightfarms.com](http://freightfarms.com))



## CASE STUDIES

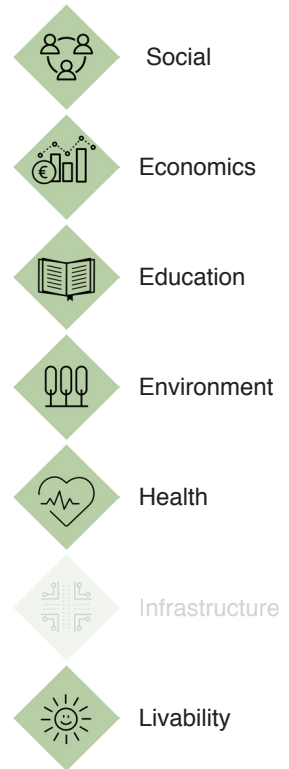
De Ceuvel, Amsterdam, The Netherlands  
Restaurant, waste management

De Ceuvel in Amsterdam is using all kind of methods to process waste. They soil is contaminated so it is not possible to dig into the ground in order to lay a sewage system. Systems like compost toilets, helophyte filters, struvite reactor, biogas boat, upcycling methods and an aquaponics system are used to re-use waste in any possible way.

In the biogas boat a biodigester is installed that convert organic waste into biogas, which can be used to cook with.

Next to a restaurant and cafe, de Ceuvel is a workplace or creative and social enterprises. The former industrial plot is now a thriving community of artists and entrepreneurs who established their own work environment on a circular office place.

De Ceuvel describes her goal as follows: "With our cultural program we try to inspire and involve like-minded individuals into a growing movement of innovation and transition to a more sustainable city, country and world."<sup>54</sup> They try to reach this goal by organizing workshops and lectures.



54 De Ceuvel, 2017

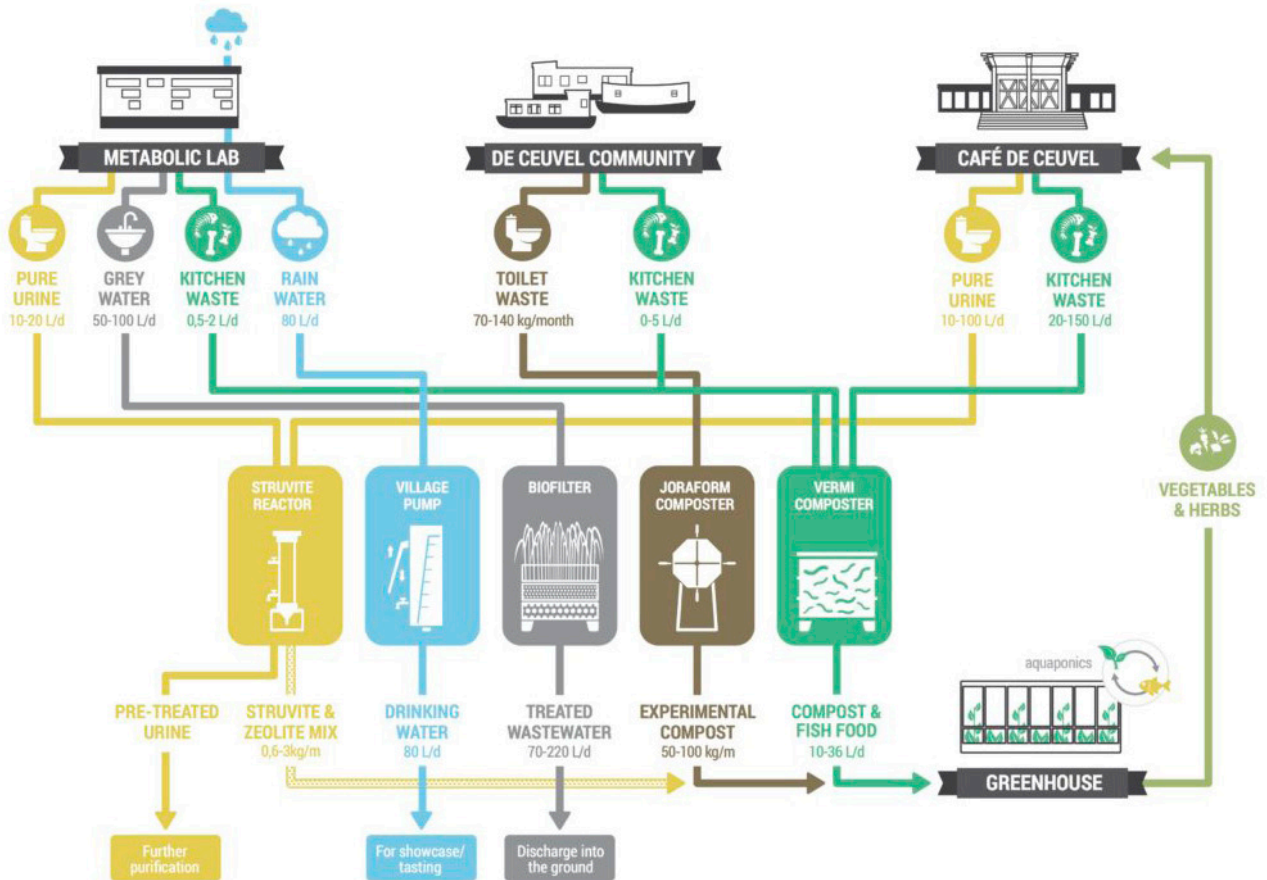


Areal view ([deceuvel.nl](http://deceuvel.nl))





Exterior (deceuel.nl)



Waste system (deceuel.nl)

## CASE STUDIES

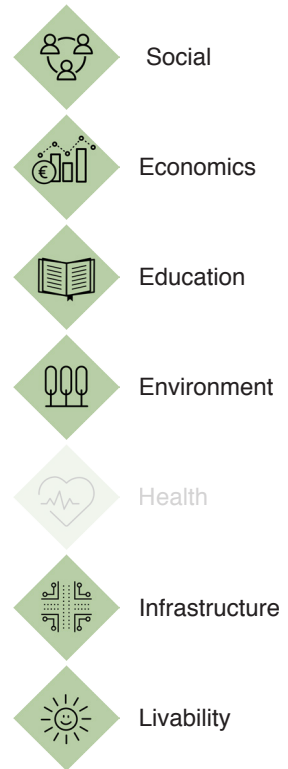
Instock, Amsterdam, The Hague, Utrecht, The Netherlands  
Waste management

Instock is a restaurant chain fighting food waste in the entire food chain. By turning food surplus into meals they reduce the food waste of supermarkets and producers.

Food is wastes because of several reasons, but our demand is the biggest contributor to food waste. Costumers of supermarkets prefer the prettiest products, while a less charming looking tomato will taste the same. These odd looking products often got thrown away before even reaching the supermarket.

Instock has restaurants in Amsterdam, The Hague and Utrecht. Next to that their food-truck promotes the use of surplus ingredients throughout the country. Instock also offers catering and event spaces.

All the dishes depend on the harvest of the day. Creative chefs make new menus everyday.<sup>55</sup>



55 Instock, 2017

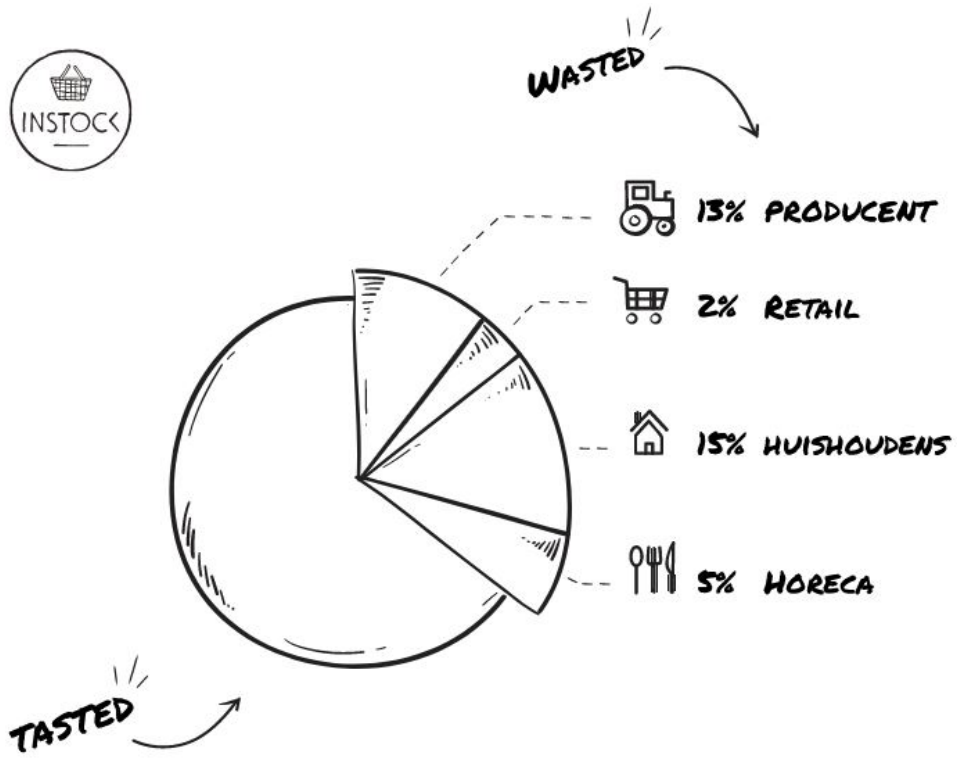


Instock challenge ([instock.nl](http://instock.nl))





Interior (instock.nl)



Produced waste (instock.nl)

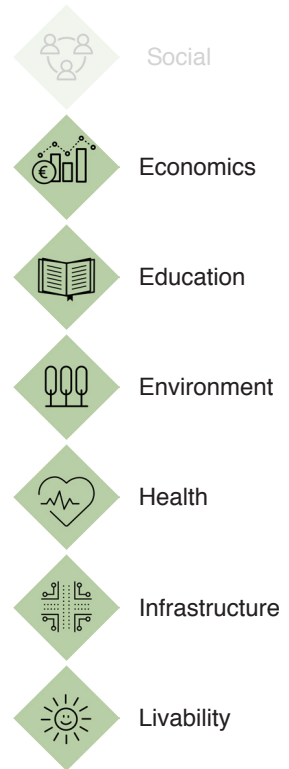
## CASE STUDIES

Forage Kitchen, San Francisco, US  
Shared kitchen, co-working space

Forage Kitchen is a co-working space for food. More than a shared kitchen, it will be a home for food makers and a hub for the Bay Area food community, in San Francisco. It's a philosophy-focused space, where local food producers can start their projects with support of the others who are going through the same experiences. They work together to source local produce and meats from local producers, while at the same time supporting the urban food-making/growing community.

If someone is starting a business, Forage Kitchen can offer a space. Office, kitchen, business support, equipment rental, preparation help and dish washing, all in one place. Besides a kitchen, this space will be a community of makers working side by side to create something really special. There will be retail space for products, as well as relationships with local stores in order to help with the confusing process of retail distribution. Furthermore, there will be classes and opportunities to complete big projects on professional equipment.

This space will provide a much-needed resource for the food community of San Francisco. A space to help small businesses thrive, but also one where people can get their feet wet, when deciding if making food full-time is for them.<sup>56</sup>



56 Forage Kitchen, 2017



Forage Kitchen ([foragekitchen.com](http://foragekitchen.com))





Kitchen ([seriouseats.com](http://seriouseats.com))



Kitchen ([edibleeastbay.com](http://edibleeastbay.com))



Exterior ([foragekitchen.com](http://foragekitchen.com))

## CASE STUDIES

Kitchen Republic, Amsterdam, The Netherlands  
Shared kitchen

Kitchen Republic describes itself as “a Food Business Incubator. A culinary platform where local food producers, food start-ups and quality caterers can grow their business with minimized risk.” By offering shared spaces and professional equipment the barrier to enter the culinary world is lowered. In the Houthavens area in Amsterdam 900 m<sup>2</sup> is open for culinary entrepreneurs who want to produce, work, sell or network.

As a start-up it is often risky to invest in a space with a fully equipped professional kitchen. Kitchen Republic offers kitchen space for rent for those who don't want to take the risk.

Services Kitchen Republic offers are memberships, daily rental, event spaces, catering and advice.

Next to the kitchen they also take care of cleaning, cooling facilities, waste management and the possibility to use an office space with WiFi.<sup>57</sup>



57 Kitchen Republic, 2017



Kitchen ([kitchenrepublic.nl](http://kitchenrepublic.nl))



## OUR SERVICES



### MEMBERSHIP

We provide easy access to a professional kitchen for artisanal producers and caterers.



### DAILY RENTAL

Temporary rent of kitchen space and equipment for a successful preparation for an event



### EVENTSPACE & CATERING

Discover how Kitchen Republic can support your next event by providing space and local catering.



### ADVICE

Take advantage of advice from our selected partners for your culinary food enterprise.

Services ([kitchenrepublic.nl](http://kitchenrepublic.nl))



Logo ([kitchenrepublic.nl](http://kitchenrepublic.nl))

## CASE STUDIES

Mission Kitchen, London, UK  
Shared kitchen

The concept of Mission Kitchen is about the same as the concept of Kitchen Republic. Mission's Kitchen main idea is to offer commercial kitchens to small and growing food businesses. Next to that a cooking community is created where people cook, work and eat together and learn from one another.

Where the concept differs from the concept of Kitchen Republic, is that at Mission Kitchen events, exhibitions, cooking classes, talks and tastings are organized. This really contributes to the key dynamics education and health. Above mentioned functions help to create a community around food.

Hobbyist home cooks are also welcome to develop their skills.<sup>58</sup>



58 Mission Kitchen, 2017



Workshop ([missionkitchen.org](http://missionkitchen.org))



# THIS IS A NEW KIND OF KITCHEN...

Mission Kitchen is here to offer affordable and inspiring kitchen space and workspace to London's small and ambitious food businesses.

It will inspire the innovators fixing our food systems, help connect our communities more closely through food, and champion our city's world-beating food culture.



## WORKSPACE FOR FOOD MAKERS

Top of the range commercial kitchens for small and growing food businesses, available at the best rates in London.



## COOKING COMMUNITY

A place for everyone working in food to cook together, work together, eat together and learn from one another.



## FOOD CULTURE DESTINATION

Events, exhibitions, cooking classes, talks and tastings that celebrate global food cultures and help us all learn new skills.

Facilities ([missionkitchen.org](http://missionkitchen.org))



Kitchen ([missionkitchen.org](http://missionkitchen.org))

## Target group

### Starter

Often apartment complexes are designed for several target groups. Mostly there are at least a couple of dwelling types in a complex. As found in the research on case studies and target groups for smart small apartments, the smart small living concept is suitable for a combination of target groups. However, for the design on the Groenmarkt one specific target group is chosen. The current housing market in Amsterdam but also other cities is asking for housing for starters. Especially the starters on the housing market do have problems finding a suitable place to live. Next to that, the Groenmarkt has a lively history of food related activities. Together with the growing interest of young urban people in the food system, the starters target group is the perfect option for a food conscious building focused on improving the awareness on food.

To give an idea on what kind of people live in the smart small apartment complex at the Groenmarkt, two profiles of potential inhabitants are made. Next to their profile a typical day of their life is shown.

## Target group

Starter

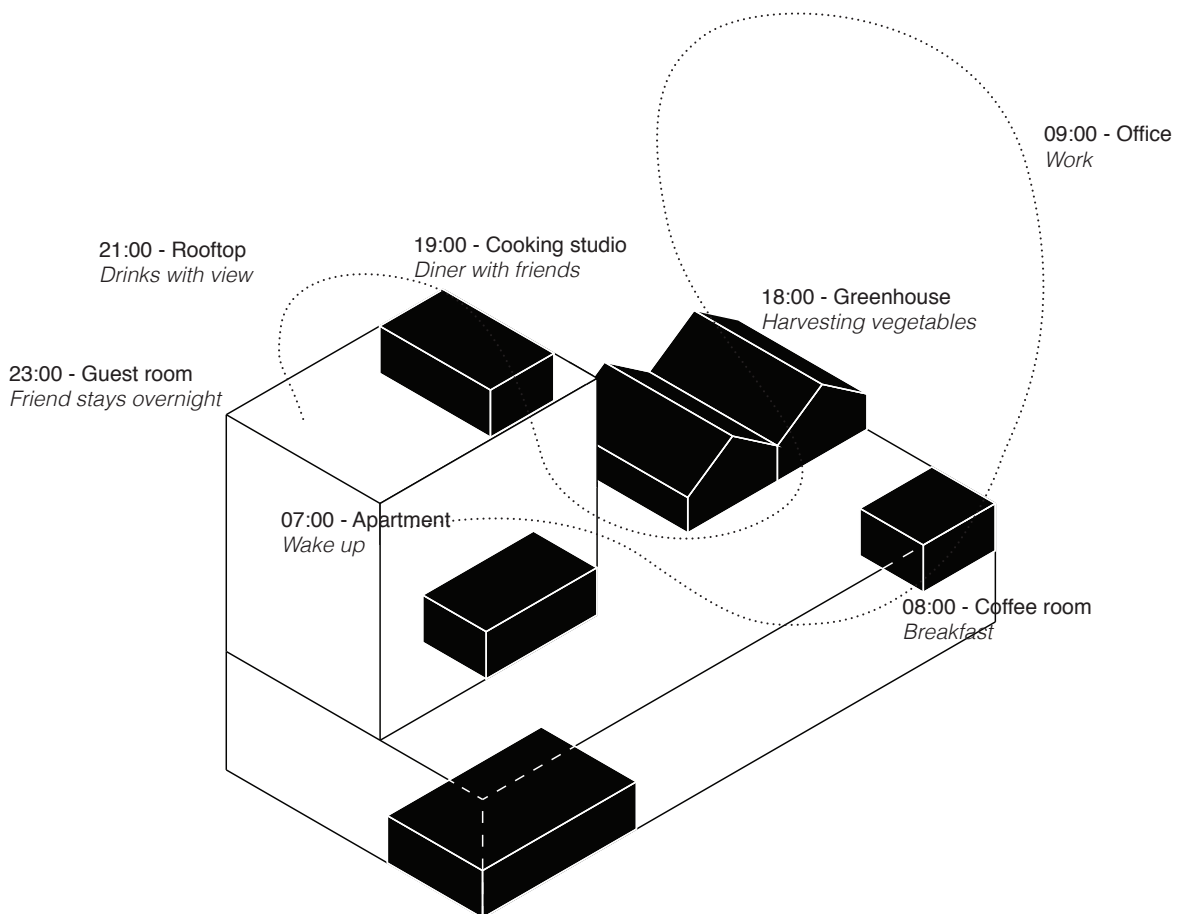
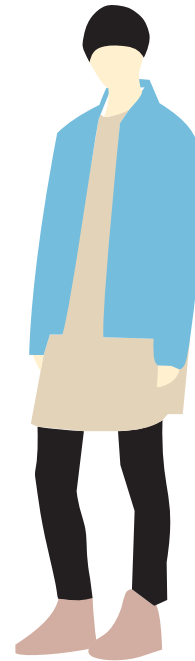
### Julia

**“I just graduated and have an ambitious job at a consultancy company. The affordable apartment, its facilities and the location are just what I was looking for.”**

- 26 years old
- Born in Aalsmeer
- Studied in Amsterdam
- Vegetarian
- Likes to go out for dinner
- Loves cooking

Favorite amenities:

- Communal vegetable garden
- Guest room
- Rooftop



## Target group

Starter

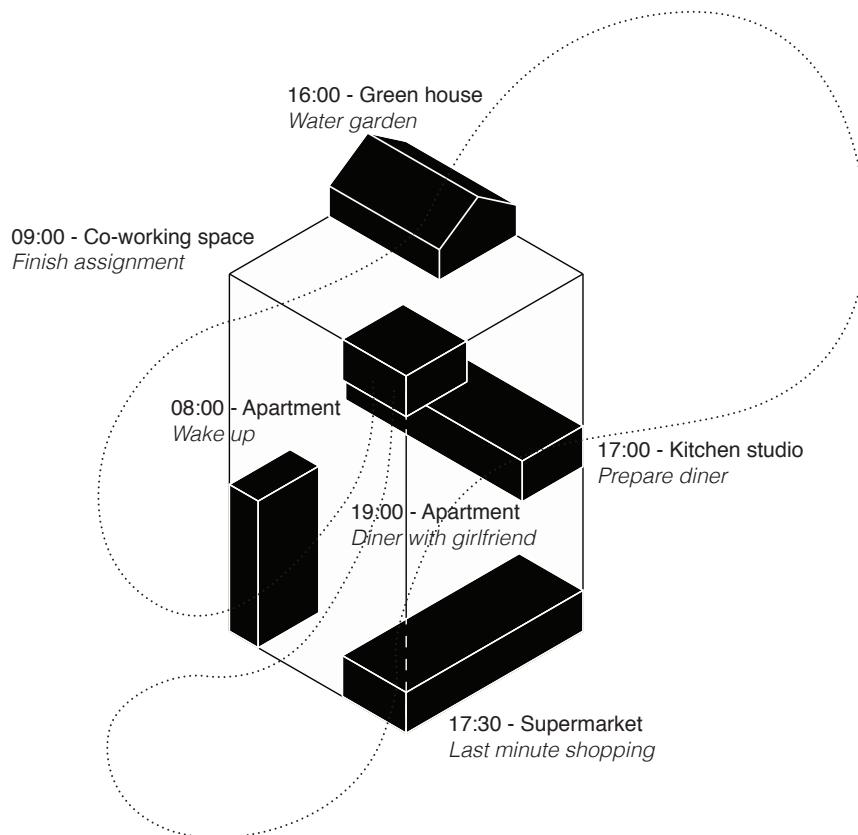
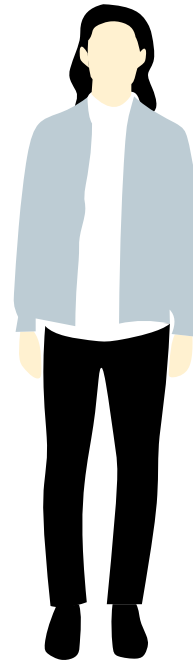
### Max

**“I’m a freelancer and used to work a lot at home. Now I live here I can work in my apartment, collective working area or in the coffee shop without leaving the apartment”**

- 28 years old
- Born and raised in Amsterdam
- Freelancer
- Foodie

Favorite amenities:

- Shared kitchen studio
- Working area



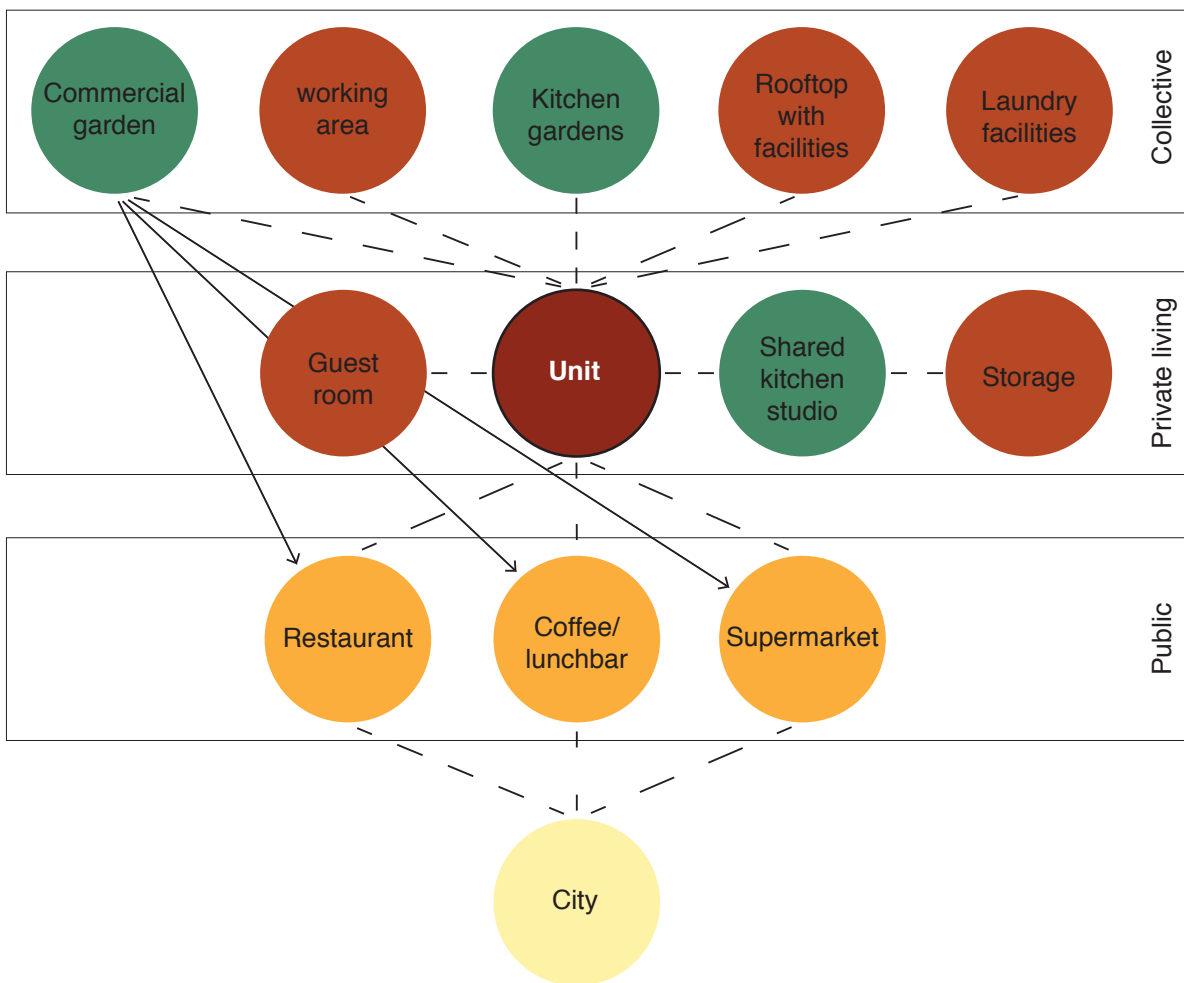
# PROGRAM

## Relations

The program in a smart small apartment complex can be divided in three categories of collective spaces. The functions that are in direct relation with the context of the complex are the public functions. For this project that are a restaurant, coffee bar, supermarket and a gym.

Characteristic for smart small apartment complexes are private living amenities. These amenities are accessible for all the inhabitants, but can be reserved to be used as a private space. For instance, when you have friends over, it is possible to reserve one of the guest rooms in the complex. Other amenities are a shared kitchen studio and storage.

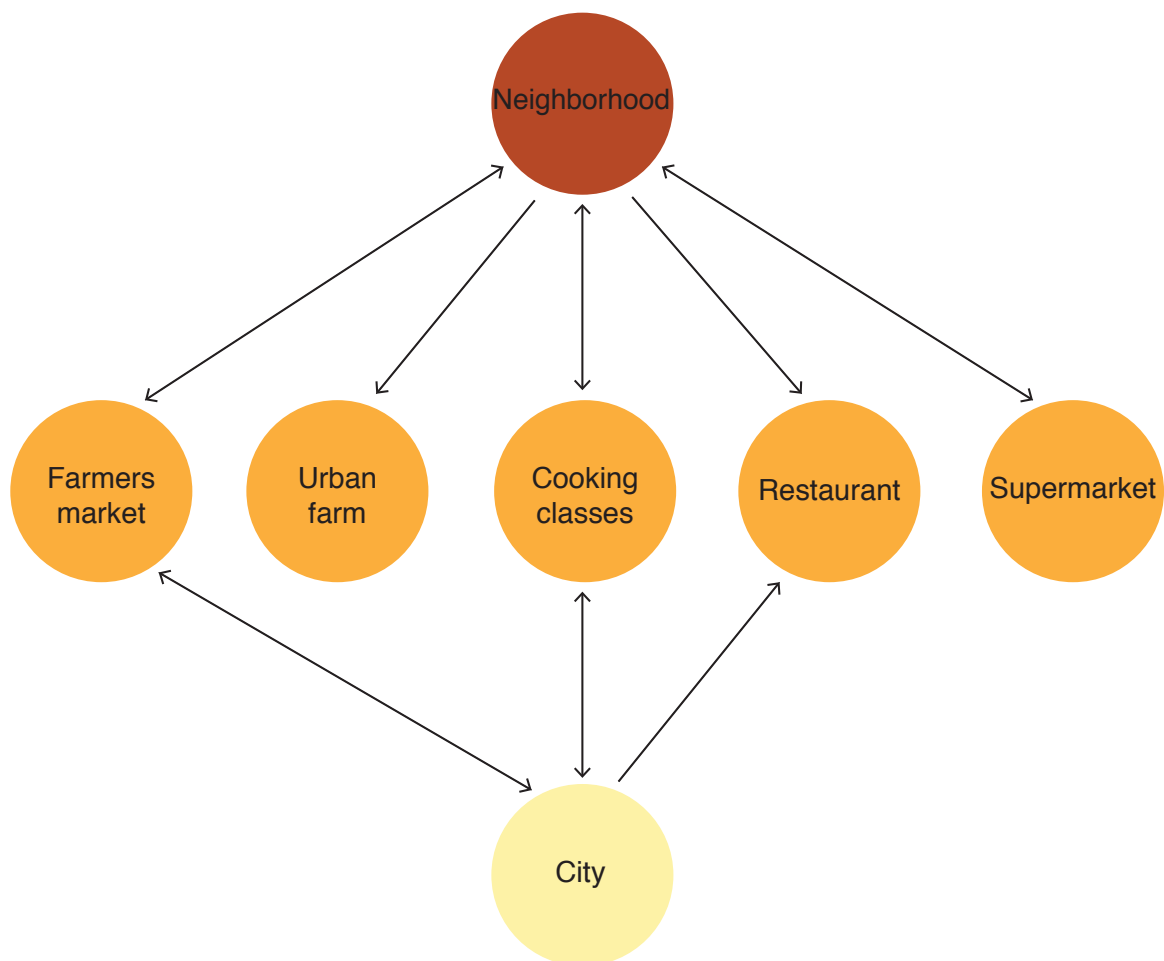
Furthermore, there are collective spaces. This are spaces that are shared by inhabitants. A commercial garden, working area, kitchen gardens, rooftop and laundry facilities belong to this category.



## PROGRAM

### Relation with context

The role of the building with its program is visualized in the diagram below. A facility of activity can either have a relation or supplying function for the neighborhood or the city. The farmers market for instance earns income from the costumers from the neighborhood and city. Next to that, the market supplies the costumers with fresh and nutritious food from local farmers. On the other hand, the gym is only serving the neighborhood without 'giving' something back.

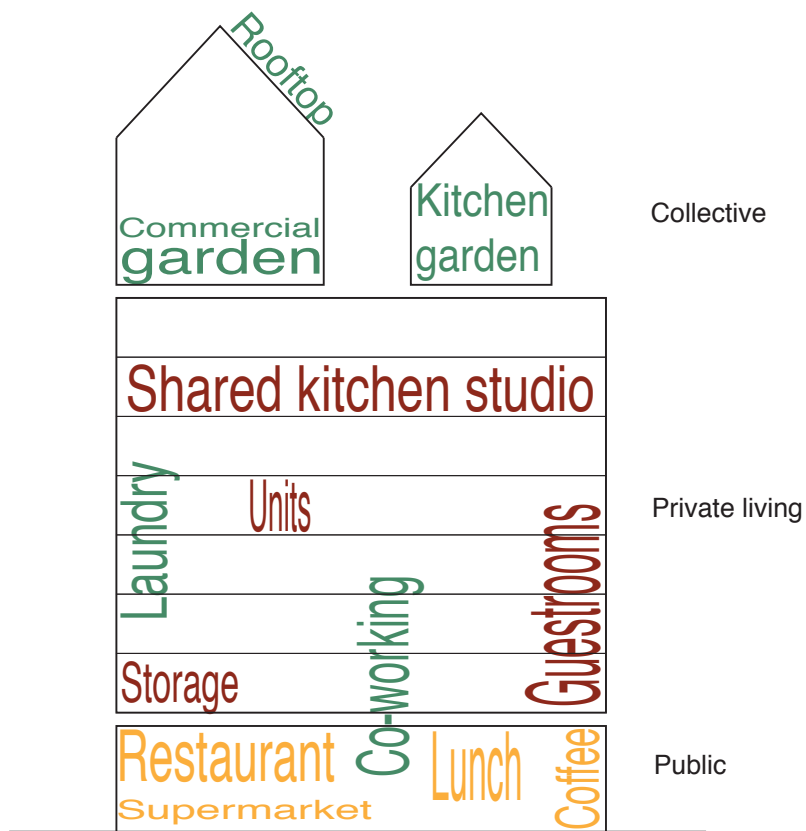




# PROGRAM

## Scheme

The scheme below visualizes a rough configuration of the public, private living and collective functions. To create a good relation with the context and urban life, the public functions are located on the ground floor or lower levels. The private living amenities are intertwined with the actual smart small apartments while the collective spaces are grouped.



## CONCLUSION

### Food

Unfortunately no relevant reference projects in terms of architecture were found during the research on food combined with architecture. The case studies that are used are useful as programmatic studies, but not necessarily as an architectural related project.

When incorporating urban agriculture in the scheme, an institutional garden is the most convenient urban farming option. This because it is partly managed by a host but also by inhabitants. Next to that it has the highest impact in terms of health and social activities. To have a bigger harvest to supply the restaurant but also inhabitants, a commercial farm can be added to the scheme. However, a commercial farm has less impact on improving the awareness. To improve the impact an educational function can be added. Each activity within the urban agriculture concept has different benefits.

The types (production building/greenhouse, orangery, oases and campus) are related to the organizational types of farms and its impact as well. Although a production building has a high yield, it is not public accessible and has a completely different atmosphere and impact compared to an oases or orangery. In the case of the new design, a combination of high production with less impact on the awareness and a low production with more social and educational activities would be the best in order to create a good functioning food conscious environment.

In the case studies that are done it is also shown that projects that are mostly focused on commercially growing food do have less impact on the improvement of food awareness and a food conscious environment. Projects where people come together to work, eat or learn have a way bigger impact. It is the best option to combine the activities mentioned above.

For the program it is desirable to situate the more public functions on street level to be sure of a good relation with the public life. However, the public amenities can also be combined with for instance an urban farm on the rooftop.

The food related public functions that will be incorporated in the design are a restaurant, lunchroom, shared kitchen, cooking workshop and a small supermarket for locally grown produce. Communal greenhouses and gardens are the collective amenities for the inhabitants.

Finally, it is necessary to state that the smart small apartments topic is the main design assignment of this graduation project. The food theme is an additional subject.









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